

MARINE CORPS
Gazette



FEBRUARY, 1946 30c



THIS MONTH'S COVER

OUR January cover depicting a communication team at work in the jungle represents the work of former combat artist, T/Sgt Harry A. Jackson, USMC, of Chicago, Ill. His interpretation of marines at war is one that comes easy for Sgt Jackson since his overseas assignment included duty on Tarawa, Namur, Kwajalein and Saipan. He knows the discomfort of tattered and filthy uniforms because his own have been tattered and filthy. He imparts the smell of death and burning rubble to his drawings because he has lived, eaten and slept with it in his nostrils. He knows the agony and dread of being wounded because he was twice wounded. As an artist, he works with equal talent in oil, watercolor, pastel, pen and ink and pencil. Sgt Jackson's skillful hand has contributed much towards perpetuating the spirit of our fighting marine.

THE MARINE CORPS GAZETTE

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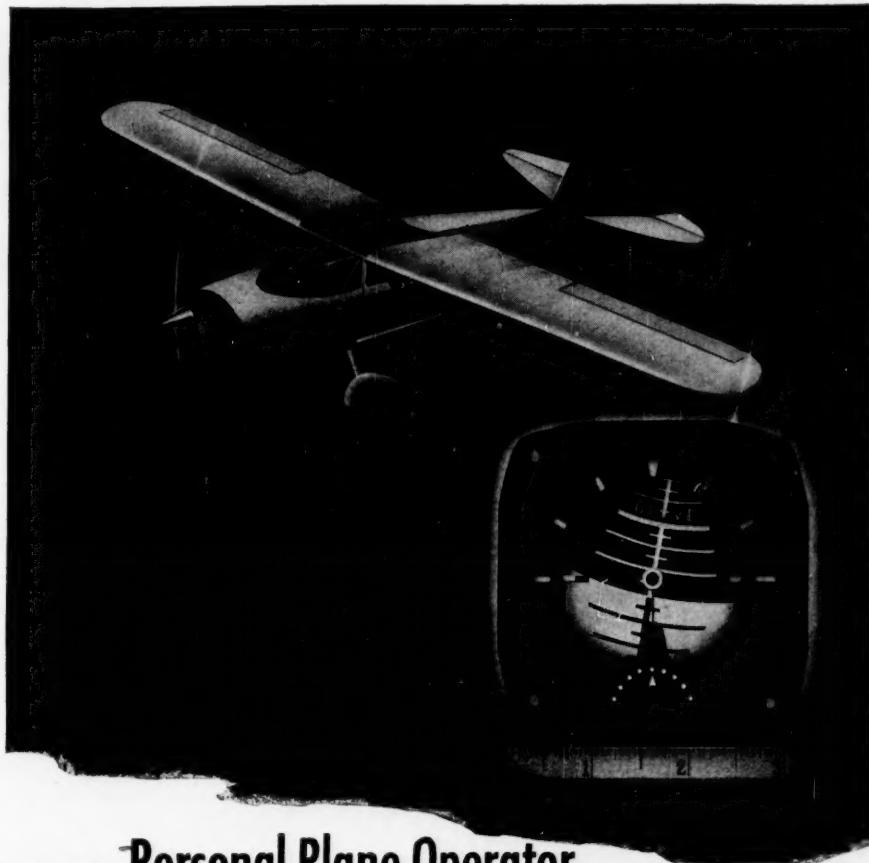
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FEBRUARY 1946

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This Month and Next

CONFRONTED with a problem that would ordinarily be handed to the Navy for solution, LtCol Robert Amory evolved a unique weapon when he converted his LCMs to gunboats and sailed the Mindanao River. The shallow draft of the LCMs allowed some tricks that the Japs were at a loss to understand until they realized that the Army had launched a makeshift fleet for a Gunboat Blitz.

Also appearing in this issue is the second article on the air victory in Europe. This analysis and review treats the work of the United States Tactical Air Force in supporting the land drives of the Allied armies into Germany.

Flying their TBF "Avengers" down Rabaul's "Flak Alley" was the job allotted to a group of Marine aviators. Their job was to bottle up the Japanese fleet by laying mines in the harbor, but it was more than a job because they knew what they were flying into—25 percent of the group are listed as missing in action.

In recognition of the third anniversary of the Marine Corps Women's Reserve, the GAZETTE is publishing in this issue a review of the work that

they have been doing in support of America's effort towards the victory and peace. It is written by Col Katherine Towle who assumed duties as commandant of the WRs on the resignation of Col Ruth Cheney Streeter.

In this edition a new feature is added to the magazine, a Military Digest section in which the GAZETTE will digest articles which appeared in other magazines and are of particular interest to marines.

Japan's dread Black Dragon Society is a thing of the past, but it was this nationalistic secret organization that controlled the Japanese military machine and the policies of the government. The story of its development and decline will appear in the March issue. Next month will also see the return of Capt Mansfield, author of "Marine With the Chetniks." After completing his duties in Yugoslavia he was ordered to duty with the Chinese guerrillas that wrecked so much havoc behind the Jap lines. It is a story of the nation that fought the Japanese since the time that the "Greater East Asia Co-prosperity Sphere" was first conceived.

CHPER CIGELAS



Lady Leathernecks

Their jobs were not glamorous, most of them were monotonous, but all have fitted into the pattern of accomplishment of which the Women's Reserve can be justifiably proud.

By Col Katherine A. Towle

ON 13 February 1946, the Marine Corps Women's Reserve will celebrate its third anniversary. Many of its "old-timers" will long since have become civilians, but those whom demobilization has not yet touched will still be carrying on.

Much has happened since that day three years ago when the hard-fighting, rifle-totin' Marine Corps startled the country, and itself, with the announcement that recruiting for women had begun. WACs, Waves, and Spars had already been accepted as part of their respective services; but the Marine Corps still looked askance at a distaff organization.

Finally, however, as it became obvious that more and more men were needed in forward areas, official opposition bowed to necessity, and plans for a Women's Reserve were formulated and approved, which provided for an organized strength of 1,000 officers and 18,000 enlisted.

Simultaneously with the announcement of the formation of a Women's Reserve, the Marine Corps announced the appointment of Ruth Cheney Streeter, of Morristown, N. J., as a director with the rank of major. Subsequently, as legislation permitted, she became, in turn, lieutenant colonel and colonel, and served as director until 7 December 1945, when she resigned to join her sons, recently released from the service. Under Col Streeter's guidance and capable leadership, the Women's Reserve reached its full strength of 18,838 in June 1944. Upon her resignation, the present director, Col Katherine A. Towle, assumed command.

DURING the first three months of its existence, Marine Corps Women's Reserve personnel received their indoctrination at naval training schools set up for Waves; officers being trained at the U. S. Midshipmen School (Women's Reserve), Mt. Holyoke, Mass., and enlisted women at the U. S. Naval Training School (Women's Reserve)—more familiarly called "Hunter"—The Bronx, New York. The first class of officers entered training 13 March 1943, and the first class of "boots" on 26 March 1943.

Since the purpose of indoctrination was to train women marines in the rudimentary methods and procedures of the Marine Corps, it was decided that this could best be realized by setting up a training program for the women on a regular Marine Corps post. Camp Lejeune was selected and on 10 July 1943 the Marine Corps Women's Reserve Schools, comprised of an Officers' Training School, a recruit depot, and several specialist schools, were established, with Col John M. Arthur as the first

commandant. The schools were in continuous operation until hostilities with Japan were ended.

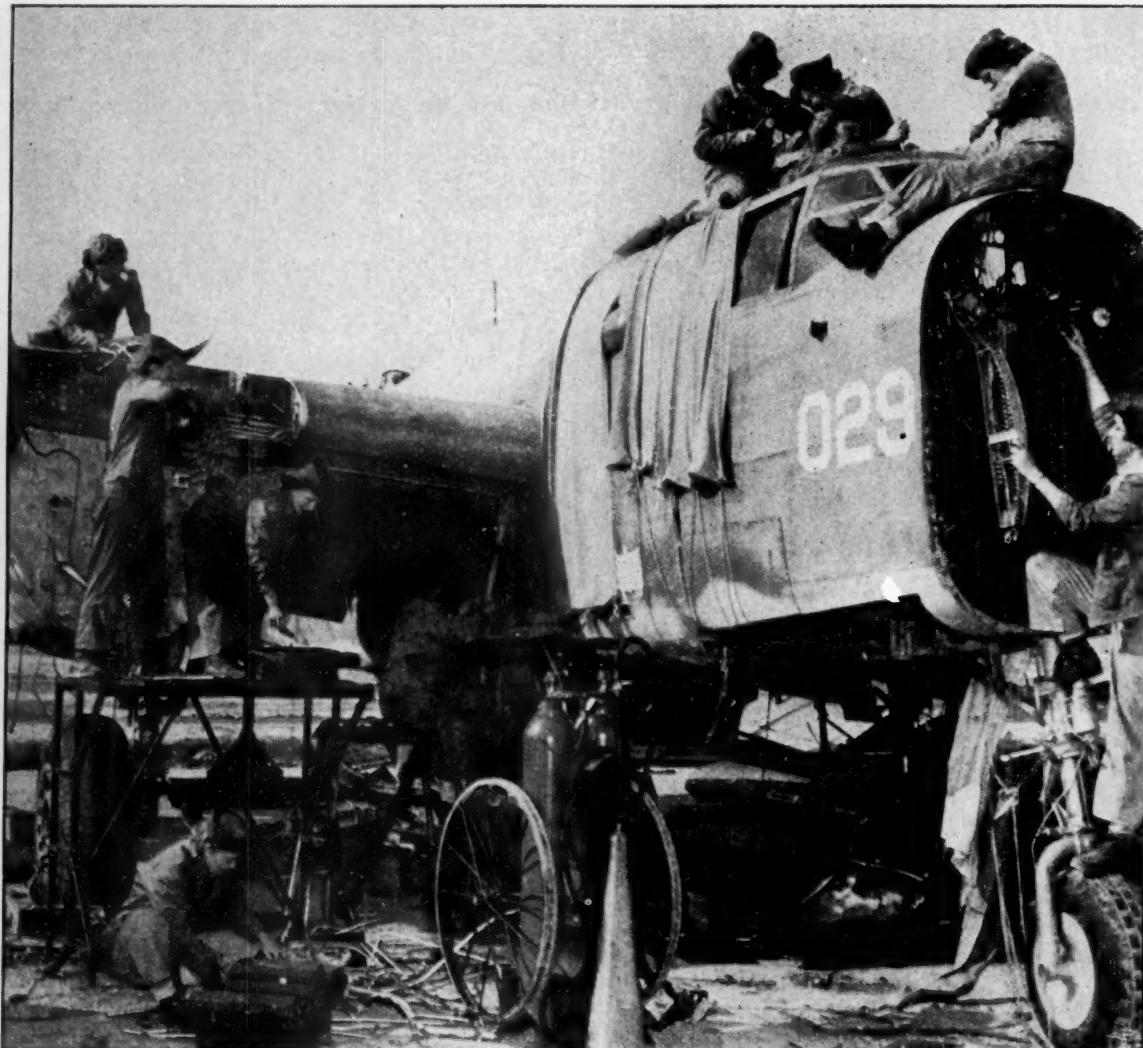
The early days were rugged for Women Reservists; many wondered what caprice of fate had made her think she wanted to be a marine! Barracks often were not ready for women's occupancy, uniforms were scarce, their own mess halls had yet to be started, which usually meant a weary trek to the nearest men's mess hall. The weather, too—in such places as Camp Lejeune, Cherry Point and Parris Island—conspired to add to general discomfort, as anyone who has experienced the long, hot, humid days and nights in the flatlands of the Carolinas can appreciate. Most trying of all, however, were the stares and jeers of the men which somehow had to be brazened out.

Finally, though, as the weeks wore on and living accommodations became not only adequate but attractive, discomfort gave way to comfort, and lassitude to enthusiasm. As the women in their smart uniforms began to look and act with customary marine self-assurance, male skepticism and ridicule gave way to admiration and a desire for comradeship. The number of marriages within the Corps attest to the success of the latter.

Swayed primarily by patriotic reasons women joined the Corps to carry out that early slogan "Free a man to fight." How well they have fulfilled their mission, official records show. Jobs were



Duty completed, these girls head for home.



WRs dismantle a "war weary" plane at the Cherry Point Air Station's A & R depot.

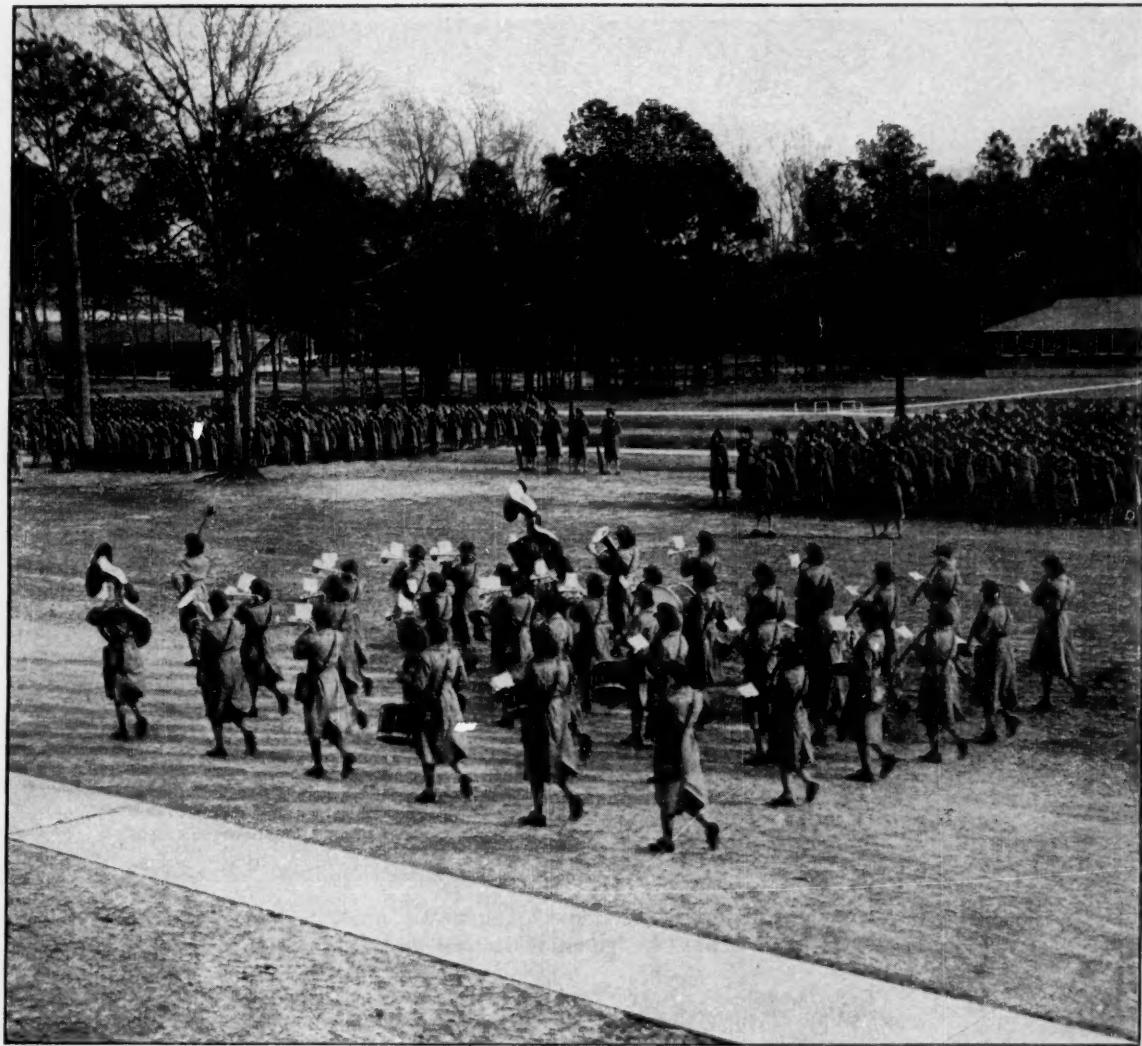


Col Katherine A. Towle

not glamorous; most of them have been monotonously routine as only clerical jobs can be; but all have fitted into a pattern of accomplishment of which the Marine Corps Women's Reserve is justifiably proud.

Women Reservists have been assigned to all large Marine Corps posts and stations and have performed scores of jobs in these three years. Upon completing basic indoctrination, all were classified according to aptitude or skills; many were trained in specialist schools directly upon finishing boot camp, such as quartermaster, communications, commissary, and various aviation specialties. Forty per cent of Marine Corps Women's Reserve personnel was allotted to the Division of Aviation and replaced men, not only in routine clerical jobs, but also as aerologists, link trainers, parachute riggers, and control tower operators.

Ninety per cent of the Women Reservists has been organized into battalions or squadrons, each



The Womens Reserve Band troops the line in a parade at the Lejeune "boot" camp.

with a woman commanding officer. Women have taken pride in running their own outfits; and when one considers how utterly foreign the regimentation of military life is to women in general, and to American women in particular, great credit is due both women officer and enlisted personnel for their adaptability and military efficiency, and their spirit of cooperation.

Disciplinary problems have been comparatively few; insignificant, in fact, when one considers the size of the organization. High morale can be attributed first, to the type of woman the Marine Corps appealed to; second, to a genuine desire to serve her country and the Corps in time of need; third, to the constant thought and effort given by the Marine Corps to recreational and educational activities; and fourth, but certainly not least, to the genuine interest and concern of male commanding officers in the welfare of the Women Reservists in their respective commands.



Col Ruth Cheney Streeter



The first contingent of girls arrives at Camp Lejeune for "boot" training. Prior to 10 July 1943 elementary instruction was given at Hunter and Mount Holyoke Colleges.

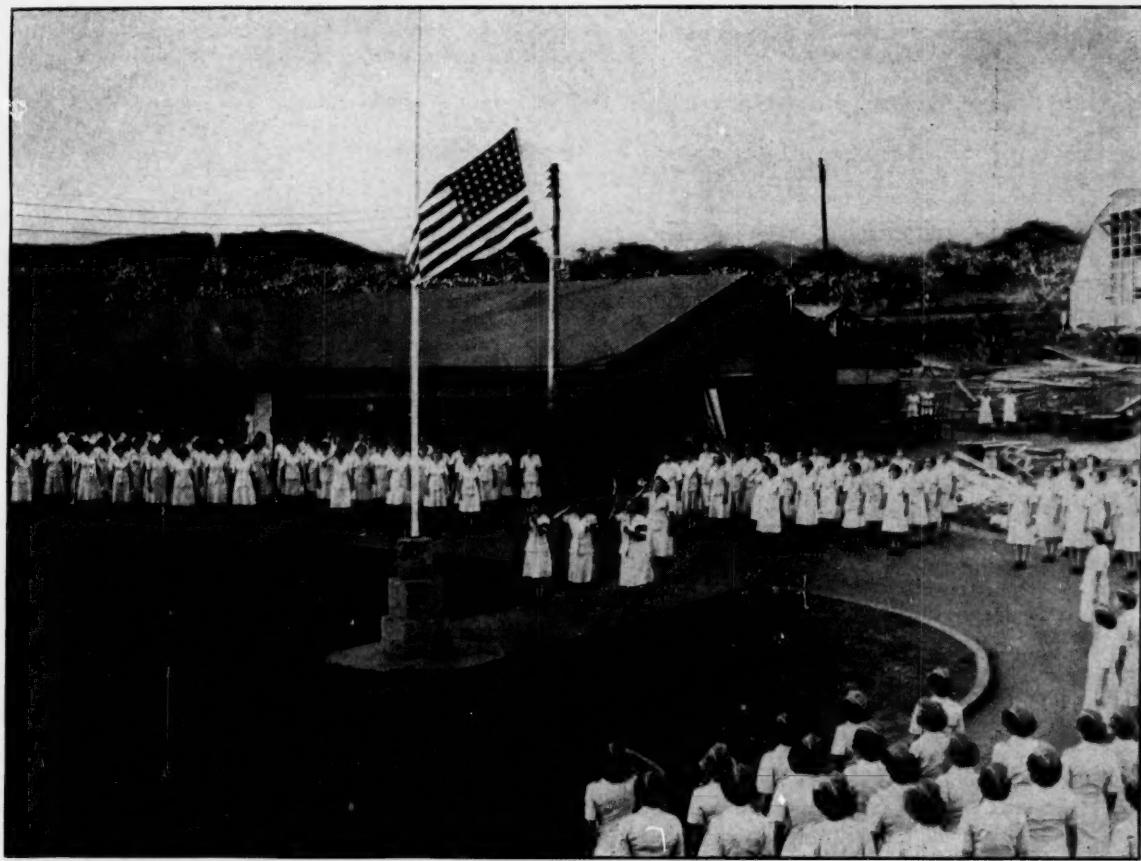
January of last year found Women Reservists serving in Hawaii. In September 1944, a change in legislation permitted women in the naval services to volunteer for duty in certain overseas areas. Accordingly, the Marine Corps prepared to send its women to Hawaii—a battalion for duty with the Marine garrison forces at Pearl Harbor, and a squadron to the Marine Corps Air Station at Ewa. A staging area was established at the Marine Corps Base in San Diego to condition and outfit Women Reservists for this new duty. In December 1944, an advance group of women officers set sail, and early in January 1945, the first group of enlisted women stepped off the gangplank at Honolulu to receive a royal welcome, and to undertake what they all now describe as "wonderful duty."

ON V-J Day there were 945 enlisted WRs and 55 officers serving in Hawaii. By the end of December 1945, the Pearl Harbor battalion had all returned stateside for discharge or reassignment; January will see the return of the squadron from Ewa. Had the war not ended when it did, Women Reservists were prepared to serve a two-year period in Hawaii, for in volunteering for overseas duty

they agreed to this condition of service. Their contribution in Hawaii, as elsewhere, was substantial, and certainly, as a booster to general morale, the effect of their presence would be rated well above average!

Probably the "sharpest" of all the Women's Reserve outfits, and one which will long be remembered by men and women of the Corps, was the Marine Corps Women's Reserve Band. Formed in November, 1943, its members were selected originally by Capt William F. Santelmann, and trained under the direction of musicians of the U. S. Marine Band. It was based at Camp LeJeune; but it "belonged" to the Marine Corps Women's Reserve as a whole.

Besides giving numerous programs and concerts at its home station, the band travelled to other East Coast posts—Parris Island, Cherry Point, Henderson Hall—and was heard on national radio programs. At the request of the Treasury Department, it made two tours in connection with War Bond and Victory Loan drives, playing in such cities as Chicago, Pittsburgh, Philadelphia, and Cleveland. Wherever it went, it captured public imagination and acclaim.



On V-J Day there were more than 1,000 women reserves on duty in Hawaiian Islands. One group is pictured standing an evening colors formation in front of their barracks.

On a tour to Washington, D. C., in October 1945, to take part in the Nimitz Day parade, the band experienced one of its most thrilling moments when it serenaded the Commandant outside his office in the Navy Annex.

Women in the Corps—and many men, too—will carry with them forever the memory of their band at the weekly Saturday morning MCWR recruit depot reviews, swinging proudly down the drill field to the strains of their own "March of the Women Marines," written especially for them by Musician First Class Louis Saverino of the Marine Band.

DEMobilization is now the chief concern of the Marine Corps Women's Reserve. At the date of writing, almost one-half of its strength has been discharged, and under the latest cut in credits several hundred more will become eligible.

Recognizing that it is now just as important to help hasten the return of combat Marines as it was to help send them out to battle, many Women Reservists who hold responsible positions have volunteered to stay on their jobs as long as they are

needed, and the Marine Corps is accepting their services gratefully.

Official pronouncement has set 1 September 1946 as the final date for the disbandment of the wartime Marine Corps Women's Reserve. Long before then most of its members will have returned to civilian life, displaying proudly their honorable discharge certificates and their discharge and Marine Corps Reserve pins; but proudest of all that the Corps should have bestowed upon them the name "Marines."

What the Marine Corps thinks of its women and their services after three years was expressed in a recent message to them from the Commandant:

"I wish to express to the members of the Women's Reserve the appreciation of the Marine Corps for the valuable contribution they have made to its success. They have performed their duties in a manner that evokes the admiration and praise of their fellow Marines; and their conduct and appearance, both on and off duty, have been exemplary and a source of pride to us all."

What the Marine women think of their Corps can be summed up in four simple words: "It's been good duty!"

END

Gunboat Blitz

thought like a Marine, did a Navy job on the Mindanao when he led an assault that was in the tradition of Farragut's campaign on the Mississippi.

By Guy Richards

WHEN they start talking about the campaign for the liberation of the Philippines, the Army and Navy may be prone to omit the part the Marines played in it. They may pause momentarily to refer, in an offhand manner, to the splendid job Marine aviators did in supporting the attack and in artillery spotting, but there is one phase of Marine action they won't talk about very much; that's the part played by Amory's Navy.

Amory's Navy was practically a Marine Navy even though its leader, LtCol Robert Amory of Milton, Mass., and all of its members were Army men; specifically, a part of the 533d Engineer Boat and Shore Regiment. Amory and his men had adopted the Marine Corps techniques as their own on New Britain, where they served with the 1st Marine Division. Their role in the Mindanao campaign was a typical Marine role; their homemade gunboats had been borne in battle with the Marines; they were being covered by Marine pilots; and they turned the trick by Marine methods. Pentagon records notwithstanding, Amory considered himself as a Marine—a Marine in Army clothing.

In the long history of the Mindanao River, strange spectacles have crowded its surface—from Japanese motor barges and bright-sailed Moro bancas to canoes tediously poled against its current or eased downstream over its long, muddy 200 miles. The natives now say, however, that of all

the Mindanao's spectacles, none has ever quite equalled Amory's Navy.

That strange assortment of homemade gunboats whipped the Mindanao into white fury and pounded its banks with the flashes and explosions of a hundred thunderstorms, and sent the Japs into an 80-mile retreat from all their positions inland, and threw a fireball at the defenders of Davao—this will go down in history as Amory's Navy.

The gunboat blitz isolated the whole western half of southern Mindanao by virtue of conquering the biggest river of the Philippines' second largest island. It killed Japs by the dozen bunches; it uprooted well-emplaced enemy companies as if they had been sucked out of the earth by a magnet, and it enabled the Army's 24th Infantry Division to move more than a hundred miles through once formidable enemy defenses with no more casualties than a reinforced company might experience in a brisk patrol action. In short, less than a dozen killed; about 30 wounded.

It was a river campaign in the old-fashioned style of Admiral Farragut's assault on Vicksburg, and for that reason it probably should have been commanded by a naval officer. In fact, the Navy toyed with the idea, and turned it down. And thereby hangs another story—a naval rejection which gave Amory far more satisfaction than the one which reminded him of his flat feet. After vigorous pleadings, not with the Navy, but with two Texas-born Army officers, MajGen Franklin C. Sibert, 10th Corps commander, and MajGen Roscoe B. Woodruff, leader of the 24th Infantry Division, Amory grabbed this inland water campaign.

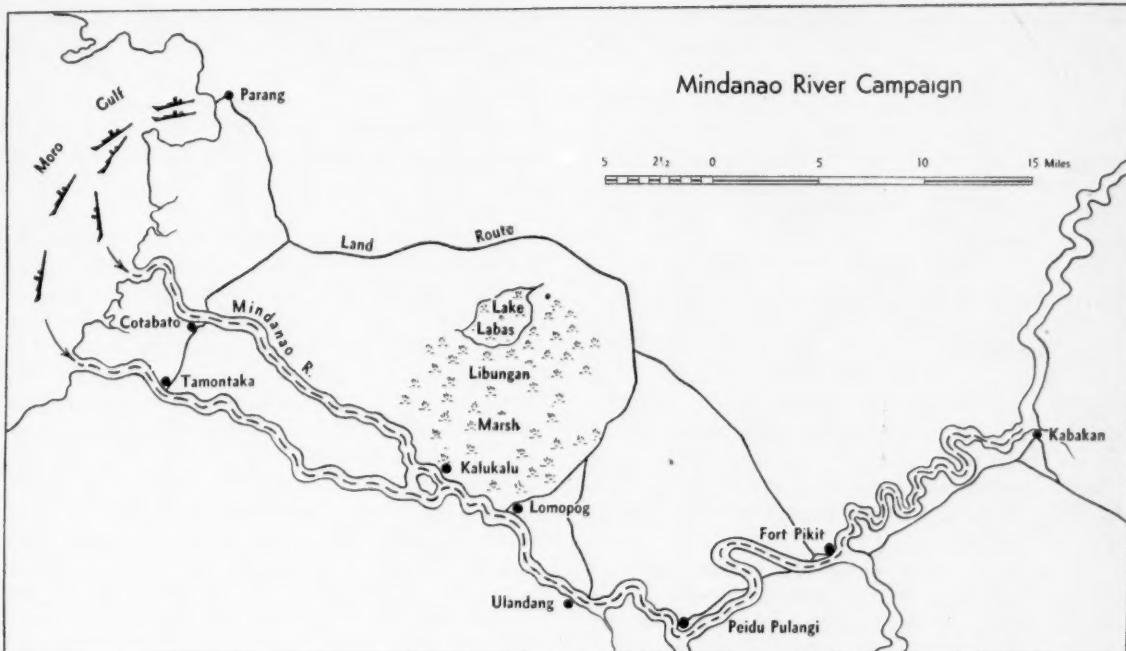
When war came, he applied to the Navy and was rejected. The Army accepted him and assigned him to the brigade of amphibious engineers mobilized in the late winter of 1942 for further training at Camp Edwards, Mass.

By October 1943, the 533d Engineer Boat and Shore Regiment divided into a boat battalion and a shore battalion and was trained in beachhead problems—carrying troops and supplies from ship to shore, building beach facilities, and transporting and resupplying later leapfrog landings from initial beachheads.

It was on New Britain, with the 5th Marine Regiment of the far-roaming 1st Marine Division, that Amory's gang first perceived the combat possibilities of the lowly, cargo-carrying LCM (landing craft, medium). The 56-foot, four-foot draft, eight-knot ramp lighters comprised the guts of the engineers' boat battalion. They had 90 of them.



Col Amory is presented the Silver Star.



Here is the route of the gunboat blitz waged by Col Amory and his private "navy."

The LCM's were simply amphibious mules designed to tote 60,000 pounds of cargo or about 80 troops plus their equipment from outlying ships to the beach. Unlike armored amtracs, or alligators, they were not even meant to carry assault waves. Their thin steel skins were unarmored, and offered no protection against so much as a sniper's bullet. Their sole armament used to be a water-cooled .50-caliber machine-gun mounted astern near the coxswain's platform. Some crews acquired a second gun to make a mount of twin .50s. Crews of three, coxswain, engineman and gunner, were often reduced by sickness and casualties to a hard-worked twosome.

Nevertheless, on New Britain, the engineers soon noticed that their Ms were able to venture where the Navy's gunboats feared to take their superior armament of three-inch guns and twin .40s. The Navy's gunboats, built on the hulls of sub-chasers and LCIs, range from 104 to 110 feet in length. When they get stuck on shoals they stay stuck—until something pulls them off.

On New Britain, while the Navy's PTs and small craft kept a respectful distance from inland fresh water, the Ms of the 533d were poking up rivers. They were landing and unloading troops on bars, sand-pits and half-sunken logs. They were exploring creeks and mangrove estuaries where sharp skirmishes with surprised groups of the enemy were often victoriously climaxed by Marines firing Garands and carbines over the gunwales while the Ms' water-cooled .50s sprayed the banks. The M could land almost anywhere. Lowering her ramp,

she promptly dumped her live cargo ashore. And presto, the waterborne Marines became a patrol—often a whole reinforced platoon, with machine-guns and mortars—which followed up the enemy. In short, the surprise element of these inland water forays provided the chief tactical weapon by which the Marines cleared the whole western half of New Britain.

Here were the very four months in which the 533d Engineers picked up most of the tricks which they played a year later on Mindanao. From Natamo Point on Borgen Bay to Cape Hoskins Airport, 15 miles east of Talasea, there are more than a dozen big rivers and sandpits and offshore islands, and each has its own enemy defenses and tactical hazards, all adding up to several hundred miles of water-rimmed mysteries. Here every conceivable problem was solved by the Marines and the landing craft crews, from beach and river-mouth ambushes to barge hideouts, trail crossings and mangrove strongpoints.

In this long-distance campaign, the Ms sometimes carried only a couple of squads of Marines, but often a flotilla would take along a whole company or a whole battalion, with bulldozers and all supporting cannon and artillery. Finally, in a grand climax to the Gloucester-to-Talasea blitzkrieg, the engineers loaded two whole reinforced battalions of the 5th Marines, more than 1,400 troops, minus assault waves, and landed them under heavy enemy mortar fire four miles west of Talasea on 7 March 1944. Just to clinch all records on this occasion, two tank-loaded LCMs became embroiled

in a brand-new type of naval battle. The tanks' turret guns, firing over the Ms' gunwales, sank two fully manned Japanese barges.

By Talasea, the engineers had become Marines. They had noted again and again the confusion brought to the enemy by the Marine-carrying Ms with their combination of mobility and surprise fire. Why not more fire? More surprise? More independent missions?

Dreams of new offensives were shortly turned into a plan of action. Almost all of Amory's junior officers had decided that they needed some bigger guns from Army ordnance to put on the Ms. They knew that most of the boats in the battalion would have to remain troop and cargo carriers. But they also knew that if they could detach three or four or five, and pile on more armament, they could blaze a shallow-water trail for the troop carriers. Without realizing it, the engineers were getting ready for Mindanao.

There were more campaigns ahead in New Guinea, including Aitape and Hollandia. Army ordnance granted them nary another weapon, but the boys had learned to salvage everything they took from the Japs. Pretty soon they had more big stuff than they could use; the problem was to select and how to emplace what they selected. It was necessary to build new decks over the cargo wells, which meant taking five Ms and switching their personalities from mules to gunboats.

Finally, it was done. On Lingayen Gulf, Luzon, in March, when Amory first heard about the Mindanao operation, the 533d had five LCM-made gun-boats armed with one 40mm anti-aircraft gun (American); one 25mm anti-aircraft dual-purpose gun (Japanese); two twin .30-caliber machine-guns (American); two naval mounted single .50-caliber machine-guns (American); rack of rocket launchers (American); and large quantities of ammunition for all weapons, including the rocket launchers. Amory also had acquired a PT detection set and installed it on his flagship.

CONSIDERABLE excitement prevailed when they heard about Mindanao, for they knew it was a river which stretches just about 200 miles through some of the wildest country on earth. From Moro Gulf eastward towards Davao, the cross-island road and its enemy defenses roughly paralleled this Mindanao River for a generous half of 140 miles. If ever a river held the keys to a kingdom, here it was.

Amory's engineers were sure the Navy would make this its show. But they lost no time in drawing up their own plan and sending it along to higher echelon.

History will show that big rivers have plunged Army and Navy staffs into amusing and sometimes grotesque discussions as to who's river it is.

If the river is big enough and deep enough to be a big ocean gateway, sustaining ports, harbors,

shipping and naval targets, the Navy is always interested. And in that sense the Mississippi, the Amazon, the Yangtze are sure-bet naval rivers. But even if the river is big and deep, and very long, but contains no naval targets, the Navy's interest is never better than lukewarm. The more the Navy looked at the Mindanao the more it looked like an Army river.

As the worst kind of inter-service brainteaser, the Mindanao River turned out to have everything. It was big and deep and long. In fact, the 7th Fleet had already prepared an excellent chart with recent prewar soundings showing that a two-fathom channel might reach as far up as 70 miles. But there were no Japanese cruisers or destroyers lurking on the Mindanao. Cotabato, six miles from its mouth, was a deep-water port. But Marine pilots of Air Group 24 had already bombed out its use by any enemy ships larger than a barge. True, the river spanned half of Mindanao. It twice intercepted the only cross-island road. It was studded with military targets and enemy defenses. But where were its naval aspects? No, the more the Navy studied it, the more it looked like an Army river.

AND the more the 8th Army studied it, the more important it looked, and the more certain it was that no matter whose show it turned out to be, it would take a lot of boats. As an expedient afterthought, the Army decided to make use of its mule-drivers' proposal for a river campaign.

Came the afternoon of D day, April 17. Events of that day's landings at Parang and Malabang, on Moro Gulf, proved we had chosen the best of two approaches to Davao, the Mindanao stronghold of 40,000 Japanese troops. We might have saved more than 120 miles of fighting by placing the 24th and 31st Divisions of the 10th Corps ashore on Davao Gulf, say at Digos or Santa Cruz. But that would have stuck our neck inside the enemy's well-sharpened teeth, and exposed our troops, ships and beachhead to Japanese coastal guns and attacks by Q-boats and strong ground forces. And we would still face the task of combing Japs from the great central thorax of Mindanao's lobster-shaped hulk.

So we had landed on Moro Gulf, 140 miles by trail and road from Davao. The hinterland had to be traversed some time. Parang was an excellent harbor, and although the long ground distance to Davao would stretch our supply lines dangerously thin, we could at least get ashore more easily to build up momentum.

After heavy strikes by 13th Air Force bombers, Marine dive-bombers, and naval gunfire from supporting warships of the 7th Amphibious Force, 24th Division troops went ashore at Parang, taking the town and harbor's high ground by 1200. Other elements of the same division followed up guerrillas to seize the big Malabang airstrip 20 miles northwest of Parang. This added a new base for

the Marine fighters and dive-bombers, operating out of Zamboanga, 120 miles to the east.

By mid-afternoon of the 17th, reconnaissance established that the enemy was manning defenses in depth along the road to Davao and that the Mindanao River, whose axis paralleled the road, but at distances from five to 15 miles south of it, teemed with more defenses and more Jap troops.

By late afternoon of D day, MajGen Sibert, 10th Corps commander, had already decided to make a try on both routes. He was not placing much faith on the river. Gen Sibert and Gen Woodruff foresaw the possibility of an enemy river ambush although Amory argued that he, with his LCMs, could blaze a way up the river faster than any infantry could fight up the road. But Amory's arguments that he could maintain supply lines, outflank the enemy's more westerly positions on the road and force the Japs to retreat to keep from being cut off from Davao, won him at least a limited mission to test the river route. Amory was to carry two small forces about 20 miles up both branches of the river to where they joined at a fork just east of Kalukalu and to await further instructions there.

The plan for April 18 was fourfold. The 21st Infantry Regiment was to send patrols 5,000 yards eastward from the beachhead perimeter at Parang. The 19th Infantry Regiment was to start fighting

its way over the main road to Davao. And the 34th Infantry Regiment was ordered to provide a battalion to be broken into two groups for loading into LCMs—one to go up the north branch of the river, the other the south branch.

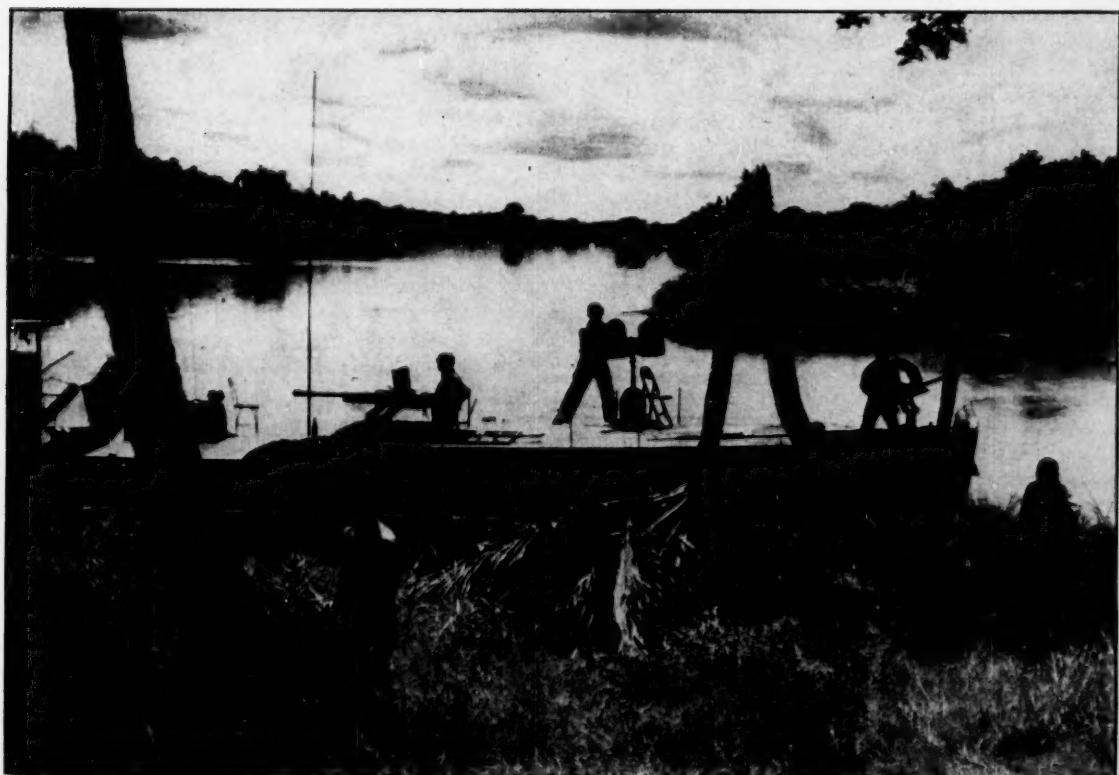
Amory made up his task forces accordingly. Maj Edwin H. Lawton was given command of the south branch force, which consisted of three gunboats, two smaller LCSs, one hospital ship LCM and six more LCMs to carry the infantry company. Amory would command the north branch force comprising two gunboats, one LCM rocket ship, one LCS and 18 LCMs to carry the rest of the second battalion plus artillery and bulldozers.

At 0630, the morning of the 18th, the south branch force left the harbor of Parang and reached the Mindanao's southern mouth at 0915—the very minute that the larger north branch fleet had covered the shorter distance to its own starting point. They both turned and moved inland simultaneously.

This was a breathless moment for the gunboaters. Aiming eyes were glued to their sights. The infantry, in the boats behind, had their rifles over the gunwales and were covering both banks.

Those first few hundred yards were pure torture. For the gunboaters there was the responsibility for leading so many troops into a possible mantrap. For the troops, veterans of many a tough battle in

Amory's men turned the lowly LCM from a strictly logistical vessel into a fighter.



the rainy forests of Leyte, this was an awkward, novel, perilous experiment. You were a clay pigeon. The enemy had all the observation. Nothing screened you. The noise of the engines announced your arrival. And the minute the shooting started you would find yourself without the resources with which a trained infantryman has learned to win his very personal wars—fire and movement, cover and concealment, the supporting fire that permits encirclement.

ONE bend was rounded. Then another. From the silent green foliage not a shot rang out. Gradually our troops relaxed, tilted their weapons, leaned more restfully on the gunwales. But not the gunboaters up in the lead.

Amory and Lawton knew that their gunboats would have to get off the first shots first. That meant seeing the enemy first. Within 30 minutes the eyes of the gunboaters were aching.

But they saw nothing. They were still within range of naval gunfire from our cruisers and under mother's wing, so to speak, when the north branch force neared Cotobato and the south branch force neared Tamontaka, each about six miles upstream. Our cruisers and Marine dive-bombers had given these two targets a plastering. The gunboat crews expected and received no opposition from either. But when they pushed on for a meeting at the junction of the river's two branches, they were ready for anything.

At 1100, Amory's forces rounded a bend four miles beyond Cotobato. Behind a bunch of reeds, they saw a flash of Jap uniform. Instantly all the weapons spoke—rockets, .25s, .20s, machine-guns. Smoke and red tracers caromed into the reeds. The clump was mown and blown away. Small arms added to the din. For a moment all you could see was blood and khaki on the ledge where once the clump had been.

When the smoke cleared away and the boats drew closer the gunboaters found three dead Japs sprawled around the wreck of a machine-gun. But the real test was still to come.

At 1500, four hours after the first brush with the enemy, the north branch force and the south branch force churned into sight of each other. Sounds of cheering broke over the steady throb of the engines. Weapons were waved and held high. The two detachments had reached the junction of the two forks at the very same instant. They were already 18 miles inland. Over winding courses, each had travelled more than 25 miles. And it was only three o'clock in the afternoon.

The two flagships pulled together. Amory and Lawton had about half of a battalion left. The rest had been put ashore at Cotobato and Tamontaka to guard those two communities and the road that linked them to the cross-island route of the 19th Infantry. Of the troops that remained, they would certainly have to sacrifice another company

right here at Kalukalu in compliance with orders to garrison and guard the junction.

Upstream, about five miles further, lurked a juicy target. It was Lomopog, intersection of another highway link to the main cross-island road. Marine pilots reported it bristling of Japs and river-bank defenses. The bulk of the main force was left as a garrison and Fox platoon was sent upstream with the gunboats to assault Lomopog.

In two phalanxes of five, with the Ms in the lead, the rocket ship and LCSs behind them, the boats deployed and swung upstream. At 1554 Amory sent a message to Gen Woodruff announcing that the two forces had joined and were "proceeding up the river to find a suitable place for a garrison."

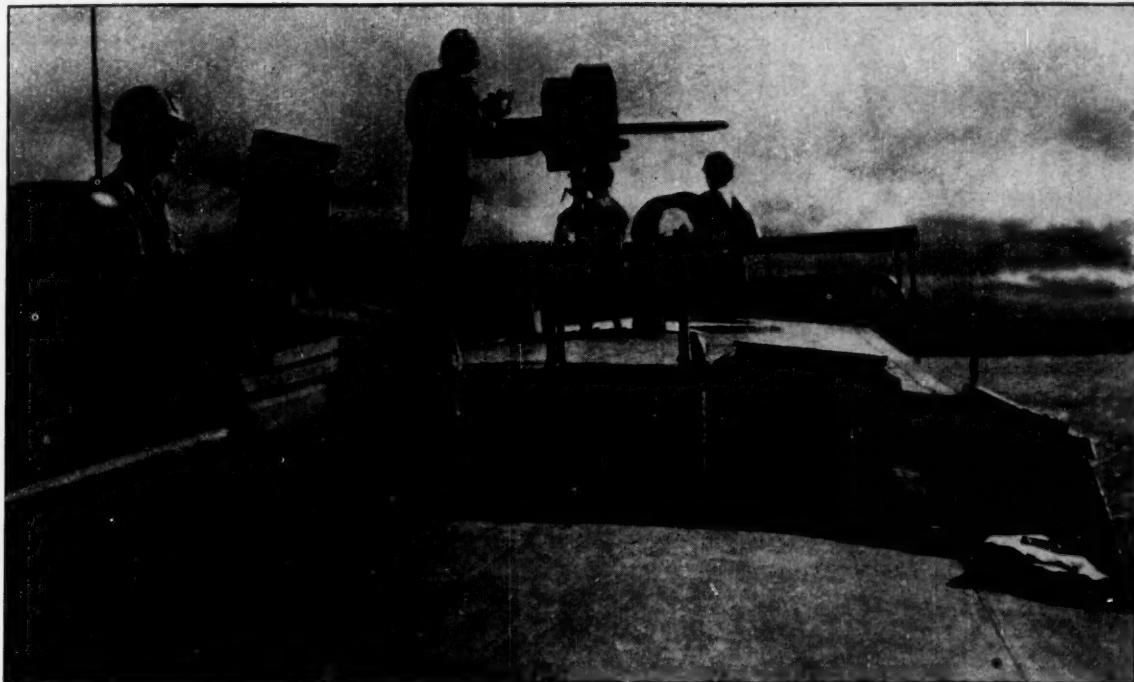
At 1645, the boats reached a thick tangle of trees around which the river makes a sharp turn to the right and to Lomopog. They throttled down the engines. The rocket ship pushed forward to join the first phalanx. As all the Ms swung to starboard, with fingers on every trigger, the rocketeers were the first to get a clear sweep on the wharf and buildings of Lomopog. In a mighty series of hisses, the rockets soared out of their launching racks to be followed almost instantly by the devilish cacophony of blasts from six different types of weapons. This time it was not exploratory fire. It was fire to confound, terrorize and pulverize.

The gunboats kept their weapons leveled at the smoking village while two cargo Ms poked their noses ashore, lowered their ramps and landed Fox platoon. In 10 minutes our troops were able to piece together the story of what had happened in Lomopog. A Japanese force, something between a company and a battalion, had been surprised and routed. Guns had been abandoned. Emplacements that had not even been hit had been left with ammunition rations and bits of uniform still in them. Everywhere were signs of desperate flight. Wounded had been dragged away.

PRESENTLY from the air cover of Marine fighters came confirmation that a considerable enemy force was retreating from Lomopog up the road to Sernaya and Midsayap. The air also reported big enemy forces milling around those communities and still larger forces at the upstream road intersections of Ulandang, Peidu Pulangi, Fort Pikit and Kabakan. Air also passed its congratulations to Amory. He had produced living and moving targets for the Marine pilots by stirring the Japs out of their holes. The pilots were having a field day. For 50 miles, the roads were filled with confused enemy groups moving in every direction.

Already the 19th Infantry, slowly forging ahead on the inland road to Davao, reported the loosening up and mass retreat of enemy forces in front of them that Amory would cut off from Davao the minute he could get as far as Fort Pikit, 81 miles by river, 47 miles by map, from Moro Gulf.

At 1100 the next morning, Amory and Marcy



The engineers found their gunboats spearheading the Army in its drive towards Davao.

gave Ulandang the same treatment that they had given Lomopog, and with the same results. After their cannonade the Japs fled. They took the village without opposition and pushed past Dulawan, where the Mindanao is formed by the Silik and Dansalan rivers.

Later that afternoon the gunboats, spitting rockets and medium gunfire, stormed ashore at Peidu Pulangi, 10 miles further up the Silik River, and sent the Jap defenders highballing inland. But for 15 minutes, it was a real scrap. A couple of hundred Japs had lingered on the banks to fight it out with the gunboats until smoke blotted out their view and their ears told them they had engaged a division of artillery in point-blank fire. Then they fled.

The bluff was still working. But it was taking a little longer each time. Miraculously, however, the engineers still had no casualties. Maj Marcy called for more cargo Ms to bring another battalion upstream and put it ashore at Peidu Pulangi.

Now all arrows pointed towards Fort Pikit, to which an 11-mile road led from Peidu Pulangi, and to which there was another route from here over 23 miles of winding river. Amory shoved off at once by moonlight. Shortly afterwards Maj Carl E. Mann brought his battalion up the Silik River in troop-carrying Ms and disembarked for an early morning advance over the road to Fort Pikit, where there was an enemy force estimated at about 1,000 men. To the heaviest river target so far, reinforced by cement entrenchments, it was going to be a race between foot troops and Amory's gunboats.

The gunboats got there first. It was a tougher scrap than Peidu Pulangi—and it was a damn good thing that Mann's battalion was not far behind. But once more the thunderous persuasion of the gunboats' weapons convinced a vastly superior enemy force that they were hopelessly outnumbered.

Four Navy gunboats came up the Silik River to give Amory a hand. They arrived just in time to aid in the bombardment of Fort Pikit, after which two of them ran aground.

By the time the smoke had evaporated, enemy scouts could see that the bluff, stripped of all its sound and fury, came from nothing more than a modest collection of landing craft.

It goes without saying that Amory's Navy not only captured Kabakan, intersection of the north-south and east-west highways, but also managed to go many miles further.

The net result of the river campaign was to put the 24th Division halfway across the island in five days. Ten days later, the division had spanned the island and fought 150 miles from its landing beach to capture Davao, the last big citadel of the Japanese in the Philippines. In all this time its main supply line had been routed over the waterway opened by Amory's gunboats—a waterway used later to launch the campaign to the north.

On his way back to headquarters, Amory had the pleasure of watching his flagship and three other Ms tow two of the Navy's gunboats from rip-shoals in the Mindanao River.

"It really isn't a Navy river anyway," said Amory. "It belongs to the Marines." **END**

Opportunities in Electronics

Marine officers may find new fields
in the military electronics courses.

By LtCol H. B. Meek

AFTER World War I, men of vision pointed to the airplane as the outstanding development of that war and presaged great possibilities for it in the war of the future. In World War II, the crushing, city-leveling air raids by huge armadas of super bombers escorted by speedy long-range fighter planes demonstrated the wisdom and foresight of those prophets of 27 years ago.

Artillery, tanks, flame throwers, rockets, naval gunfire, submarines, demolitions, and antiaircraft weapons represent vast improvements, or innovations over the weapons of World War I. Then to climax it all came the atomic bomb and the obliteration of Hiroshima and Nagasaki.

With the two World Wars for comparison, is there any marine who doubts that the best weapons and equipment of today will be as obsolete 25 years from now as the tanks of Cambrai are compared to the tanks of Okinawa? The evidence at hand preponderantly indicates the affirmative. All marines should therefore prepare to meet these developments by a corresponding improvement of mind and broadening of knowledge.

A development of World War II mentioned above is the use of electronics in war. The prophets of today are predicting as much for electronics, jet propulsion and atomic power as those sages of 1918 were predicting for the airplane. Electronics in World War II first came to the front in the employment of radar and sonar equipment. From a small beginning, use of electronics expanded until it became a decisive factor in the final outcome of the war.

The field of electronics in the future will invade every branch of the Marine Corps. It will be of such vital importance in warfare that every marine will have to become familiar with the use and employment of electronic devices and electronic controlled equipment.

Postwar Marine Corps plans attach considerable importance to electronics in the future. The door is now open for young officers with the proper qualifications to enter the electronic field in the Marine Corps. Letters of Instruction No. 1184 and No. 1198 are the first steps by the Marine Corps to prepare its officers for the future and whatever the developments in electronics may bring.

The first L. of I., No. 1184, asks for applications from lieutenants of the Marine Corps ground forces to attend the postgraduate course in electronics engineering at the Postgraduate School, Naval Academy, Annapolis, Maryland.

This course will qualify officers for electronic engineering duties concerned with the design of electronic equipment. Three years of study will be necessary. It is expected that the entire three years will, ultimately, be spent at the Postgraduate School, but in the interim, two years will be spent at Annapolis and the third year at a leading American university. The first class in this course will convene on 1 July 1946 and applicants are being requested to forward their applications through channels to arrive at Headquarters, U. S. Marine Corps, prior to 15 May 1946.

The second L. of I., No. 1198, requests applications from lieutenants of the Marine Corps and Marine Corps Aviation for enrollment in the Electronics Engineering School at Massachusetts Institute of Technology. This is a 20-months course and will entitle successful graduates to a B. S. degree in electronics engineering.

Marine officers, upon graduating from the course at Massachusetts Institute of Technology, will receive further instruction for 12 weeks at the Signal Battalion, Camp Lejeune, N. C. This 12 weeks will be devoted entirely to practical training and indoctrination in the characteristics of all types of radar equipment used by the Marine Corps.

Classes will convene every four months beginning 6 March 1946, at Massachusetts Institute of Technology, and applicants are being requested to forward their applications through channels to Headquarters, U. S. Marine Corps, at the earliest practicable date.

To be eligible for enrollment in either of the two schools described above, officers must have had schooling in mathematics through differential and integral calculus equivalent to that required for a B. S. degree in mechanical, civil or electrical engineering, or in applied physics.

Regular officers of the Marine Corps and reserve or temporary officers applying for a regular commission, and who are eligible as described above, should give the opportunities in electronics serious consideration.

In addition, those reserve officers now on duty in the Marine Corps, who have not at this date applied for a regular commission, and those reserve officers who have been returned to inactive duty might well consider the possibilities of an electronic future with the Marine Corps. Applications from these officers will be considered, provided they apply for a regular commission in the Marine Corps and have the prescribed educational qualifications. Application for a regular commission must be made within six months after having returned to an inactive status.

END

Marine with the Chetniks

Cut off from

regular guerrilla forces, this OSS officer played a perilous hide-and-seek game with the Nazi troops who infested the mountains of Yugoslavia. By Capt Walter R. Mansfield

Last of two articles on the adventures of a Marine with the OSS.

Although this article tells of the activities of General Draga Mihailovich and his Chetnik guerillas, it is presented only as a narrative of a marine's adventures as an OSS officer. The politics of the situation need not concern us, because the scene is laid in 1943 before the Allies had made a choice between Mihailovich's Chetniks and Tito's Partisans. Gradually however, Tito convinced the Allies that his guerrilla movement would prove more valuable than Mihailovich's in winning the war. Although recent Yugoslav elections supplied another democratic "bone of contention," Tito won by an overwhelming margin.

THIS was the hey-day of our adventures. Three days of fantastic life followed—Italian cognac, good food, white bread, a bed to sleep in—these are some of the memories. Col Grazziani, commander of the Italian garrison an innocuous little man with a gray beard, was most gracious. He told us that he had received orders to work out a plan for our "joint cooperation" against the Germans! We quickly established a joint interior guard.

Italian lorries were dispatched with patrols up the roads to Visegrad and Plevlje, to warn if any German forces came. Guerrilla guard detachments were placed at both ends of the town and the bridge across the Lim River. A quick inventory was made of all Italian arms, ammo and supplies on hand. Gen Mihailovich was advised by courier and sent us 500 guerrilla reinforcements with horses. The Fascists, about 80 in number, were imprisoned in one stockade. The rest of the garrison, about 1,200 men, roamed at large. Heavy weapons were all placed at one end of the garrison.

OUR greatest fear was that our own guerrillas, drunk with glory and too much "rakia," would run amuck and precipitate trouble. This was somewhat alleviated when we issued several hundred Italian GI boots and blankets to the guerrillas, and distributed some of the smaller arms.

The guerrillas were like children. Dressed in big yellow Italian boots, carrying blankets over their shoulders, but still wearing their black hats and long beards, they looked like a day at the circus! Luckily for us, the strong discipline which had been instilled into them by their woods' commanders was used with good effect by Maj Tersich and Lt Novarkavich. There were no outbreaks. A remarkable number of our men, however, began to blossom out in Italian uniforms!

Col Grazziani, apparently assumed that LtCol Duane Hudson and I, as the representatives of Great Britain and America, had much more power than actually was the case. His first request was that we notify Gen Badoglio's chief-of-staff, through our Allied HQ, that he was well and working with us; also that we arrange to get some of his officers back to Italy to discuss plans for our fighting together! We agreed to this rather than raise any issue.

The problem of what the Italians would do if the Germans came was quickly answered the following day. Our patrols reported that a large German force was advancing up the road from Plevlje. We decided to evacuate rather than rely on the Italians to join in making a stand against their recent allies. Col Grazziani advised that his

What Has Gone Before

In the first installment, Capt Mansfield told of parachuting into the Yugoslavian mountains in mid-winter to become the first American OSS liaison officer to the Chetnik guerrillas commanded by Gen Draga Mihailovich. Joining two British officers already there, he entered into the swift hit-and-run war that was being conducted against the Nazi garrisons. The constant threat that the Germans would find their headquarters kept them on the move and necessitated forced marches that would have stopped well trained and equipped troops—a credit to the morale and resolve of the partisans. In command of a Chetnik unit, Mansfield participated in a raid that damaged a railway tunnel and destroyed a bridge on the same section of track. It was a strange kind of war, a war of constant movement, a war of retreat planned to coincide with attacks, a war that gained no territory but kept the Nazis constantly harassed. However, the greatest indignity to the Axis came when the band of roving warriors effected the surrender of a complete Italian garrison with nothing to back them up except their bluff. Armed with a variety of weapons that should have graced a museum, the Chetniks were miraculously an army.

officers preferred to remain in their garrison. During the next few hours, we got our guerrillas started on a quick exodus up through the mountains. Before leaving, however, our men loaded 15 of the mortars with several hundred rounds on the horses and carried out a large number of rifles, machine guns and ammo. By nightfall, we were camped near Ravenje up in the mountains.

Later that week, we found out that the Germans had taken large numbers of the Italians as labor troops, while hundreds of others fled into the woods. Thereafter we were plagued with stray Italian soldiers wanting to join us. Most of them were far too soft, however, for guerrilla life and ended up working on peasant farms for their keep. A large force of disarmed Italians was also seen marching up the road to Visegrad in perfect formation. Whatever became of them we never learned.

Gen Mihailovich was now in a terrible temper. For the first time, BBC radio in London was glorifying Tito and his Partisans to the exclusion of Mihailovich—this despite the fact that the Chetniks, since the Italian surrender, were attacking Germans everywhere. Tito, the Croat leader, had a large group of guerrillas, whose main force was scattered through the mountains of Croatia, Bosnia and Herzegovina, far to the east and north of us, while Mihailovich's strength lay in Serbia. In the early days of guerrilla fighting, they had, for a short while, joined forces but soon Mihailovich, a regular army officer who stood for a monarchy, split with Tito, who was sponsored by the Soviet Government and a "People's government." Bloody civil war raged throughout Herzegovina and south Bosnia.

The difference was not merely ideological. Serb officers charged that Tito had welcomed into his ranks former Croat traitors and Ustachi who, the Chetniks charged, were responsible for Yugoslavia's downfall in 1941. Tito, on the other hand, justified his attack on the Chetniks by claiming that they were collaborating with the German occupateurs. (Tito also charged that Mihailovich cooperated with the Nazis and Fascists.)

Both Tito and Mihailovich were jockeying for Allied support. Allied missions and supplies were parachuted to both guerrilla groups. Now that Britain as well as Russia appeared to be siding with Tito, we Allied representatives with Mihailovich stood in the middle of a chaotic condition. Mihailovich, ignoring the British, turned to me in his anger and pleaded for more American teams to come in and see for themselves what his guerrillas were doing.

J RADIOED his requests to Cairo but privately felt that the issue must be settled on a much higher plane. I felt it would be a sorry situation if Allied missions on both sides found themselves using Allied equipment to destroy each other rather than the Germans. Could there not be some meeting

ground, some point of settlement? Our only lever with guerrillas in the field was supplies. I hoped for some geographical settlement under which Tito would stay in Bosnia and to the north, and Mihailovich in Serbia, his stronghold. Submission of such a plan to Mihailovich would be a ticklish proposition, however, for the reason that he claimed to be the legal commander of all Yugoslavia, not just Serbia. Furthermore, Tito's forces were now threatening to push into Serbia.

In the midst of this confusion, Cairo advised us that an American colonel and British brigadier were scheduled to parachute into us in the late September moon. We selected two drop zones with care because just after we had received our last supply drop, a Messerschmitt had appeared and machine-gunned the fires. Luckily no one was killed.

IN LATE September, after several nights of waiting and radioing back and forth to Cairo, we received by parachute the new delegation which consisted of Brigadier Armstrong with three British officers, three enlisted men, and my new commanding officer, Col Albert B. Seitz, the only American in the group. At the same time several tons of badly needed military supplies were dropped. There was the usual hustle and bustle and we stayed up all night distributing and caching supplies in case of a forced march.

Col Seitz proved to be a tall, pleasant Virginian who rapidly won over the guerrillas by his easy affability. After I gave him a complete report on the current situation, several more conferences were held with Gen Mihailovich. It was decided that we would launch a large-scale attack on the city of Visegrad, where over 800 Germans were garrisoned. We were to wipe them out and destroy the large railroad bridge which spanned the Drina River, between Serbia and Bosnia. Orders were sent out to all Chetnik guerrilla leaders in the general area. Over 2,500 guerrillas were gradually massed with their arms in the woods south of Visegrad. There was no doubt that Mihailovich was out to put on a big show, with hundreds of bearded guerrillas appearing from all sides.

At dawn on 4 October 1943, the attack was launched with heavy mortars, light artillery and small arms fire. I shall never forget the skill and intrepidity of the mortar crews, many of whom were formerly artillerymen of the Yugoslav Army. Now, handicapped by lack of sites and base plates, they still were lobbing shells in with remarkable accuracy. I particularly noticed one crew. A member would crawl up to the ridge, peer at the German "bunkhouse" under attack, watch the shell land and after looking back and forth between mortar and "bunkhouse," motion with his hands to show how much the mortar's position should be changed. The eighth shell landed solidly on the top of the "bunkhouse."



U. S. Army LtCol Albert Seitz, left, with some of the Chetnik guerrilla leaders.

The fighting continued all morning, with our patrols gradually infiltrating until contact was made. By the afternoon, we had the town and had killed or wounded over 200 Germans. The balance withdrew. We quickly set to work to destroy the armored railroad car left behind by the Jerries. Then everyone pitched in to prepare charges for the huge steel bowsprit bridge, which we blew into the river that afternoon. The guerrillas proceeded to Rogatica while we stayed behind.

Every radio report now indicated that the British were endorsing Tito, whereas no position had yet been taken by the United States except to support any group fighting the Germans. Realizing that the American headquarters would want a comprehensive picture of Mihailovich's strength, Col Seitz and I embarked on an ambitious inspection tour of all the outlying Chetnik forces throughout Serbia. Travelling light, minus radio or any heavy gear, we moved northward from one guerrilla band to the next toward the Sava River, sticking always to guerrilla "safe canals" for passage.

The Chetnik guerrillas were organized geographically into Korpus commands. Each Korpus commander was assigned a large territory in which he had two or more brigades (under-strength) under his command. There were always more young peasant recruits than could be handled effectively due to the lack of arms, ammunition and supplies. Before joining, each recruit took a solemn oath, administered by a local Orthodox priest, pledging allegiance to the Chetnik cause and to his king. Once he became a Chetnik he was divorced from

home and family and must now follow orders strictly, under penalty of death.

All the new recruits were put through a course of basic training, scouting and patrolling up in the woods. Many would have to capture their arms. Until then they served as couriers and reserves. It was a fantastic, nomad life. It was only discipline and a strong, fervent belief which kept these men together. They received no pay and only meager supplies. In general, we found that the Korpus and Brigade commanders were superior men of more than average ability. With only the force of his personality to keep his men under control, each leader had to be a resourceful man.

FIRST we visited the Korpus area under Maj Racic, a huge black-bearded man who rode like a cowboy. Passing up through his district on horseback we were joined by more of his guerrillas. Our trip took us through scores of towns and villages under Chetnik control where hundreds of peasants, townsmen and guerrillas came out to greet us and shower us with flowers. At almost every stopping point, the people would hold a great feast in our honor, outdoing themselves to spread out pork, chicken, fruits, wine, rakia and all the food they possessed. We became regular gourmands, and on Thanksgiving Day, they even prepared a turkey dinner for us! With each guerrilla commander, we held long conferences to find out his past and proposed operations, the number of men in his group and how much they had in the way of arms and ammunition. We held mass inspection of guer-



The author poses with a guerrilla leader.

illa forces wherever we went and took many photos.

As we proceeded northward, we entered the great, rich plains region where we had to move much faster in order to dodge Nazis and German occupation forces, but we still received the same enthusiastic greetings everywhere. Through the local guerrilla radios we were able to keep in touch with Mihailovich's headquarters, now far to our south.

AFTER getting almost as far as Sabar, a German-held city on the Sava River, Maj Racic handed us over to Maj Milovanovic, commander of the next Korpus to the east. Once again we went through the same process of receptions and inspections. For the next month we continued this grand horseback tour all over north Central Serbia, going within 20 miles of Belgrade itself. At Oplenac, the king's country estate, we drank wine from King Peter's own cellars, practically under the nose of the German garrison, which was less than 1,000 yards away!

Winter was now rapidly coming on and we waded through trails covered with mud, slush and snow. We finally ended up at Maj Cvetic's far to the south in the mountains near Nis, after walking and riding hundreds of miles, mostly over mountainous terrain.

Throughout this tour, we were amazed at the large amount of free territory in which we could roam at will. It was almost impossible to believe that we were in a German-occupied country with enemy troops only a few hours away. It was more like a glorious victory march. Of course, there were some tight spots, as well as tragedies, such as instances where German troops on our trail would burn down houses in towns where we had stayed

and take hostages. In general the Germans confined themselves, however, to main lines of communication and cities, and only occasionally made forays up into the outlying regions.

It was now December 1943. Gen Mihailovich's position with Russia and Great Britain was going from bad to worse. They were backing Tito to the hilt. All supplies to Mihailovich were cut off and no more planes were assigned to us. Without supplies we could not operate. Col Seitz and I had collected a mass of data and intelligence which we knew would be of great use to our own headquarters if we could only get it to them. We had inspected about 35,000 Serbian guerrillas and had a detailed account of their entire set-up.

We were now unable to get back to Gen Mihailovich because a large German force had penetrated the valleys between and cut us off. It was under these circumstances that we decided to try to make for the Adriatic Sea, over 200 miles to our east, and get across to Bari, Italy, which had just been taken by the Allies.

Col Seitz decided that we should not try to make the perilous journey to the coast together. The Gestapo were trailing us like hawks and we did not want to risk all our eggs in one basket. Furthermore, there was still work for our report which must be done before departing. I had become fairly proficient in the Serb-Croat language and could easily handle what remained to be done.

On the morning of 24 December 1943, Col Seitz started out with a small band of guerrillas to walk to the coast where he would try to capture a small fishing craft and make his way across the Adriatic to southern Italy. As soon as I had completed the work I was to try to rejoin him at a point in the mountains near the coast, unless he had already succeeded in getting across to Italy.

Heavy winter snow had set in. Now, on the day before Christmas, for the first time I was alone, holed up in the little mountain village of Srednja Reka with a group of local guerrillas. The guerrilla chieftain, Maj Cvetic, and Capt Todorovich must have sensed that I was feeling rather low. Secretly they made preparation for a little feast, sending peasants down to nearby German-held towns, to acquire food and wine. On Christmas Day, 1943, all the peasants and guerrillas dropped in to pay their respects, many bringing little gifts. Milutin, my pack boy, chopped down a little pine tree and fashioned little tallow candles on the branches. A huge roast pig was served as a fitting climax. Such tender, unsolicited care and generosity on the part of these people made me feel proud to be fighting alongside of them.

DURING the following weeks, I inspected more troops, took part in a road ambush in which we destroyed at least six German trucks, killed or wounded about 25 Jerries, and captured some loot, including more rifles and machine guns. German

reprisals were heavy, however. In the middle of January, 1944, I started out with Capt Todorovich and a small group of guerrillas for the long hike overland toward the Dalmatian Coast. For three weeks, we marched steadily almost every day, up and down over back mountain trails, doing about 40 or 50 kilometers a day before reaching the exhaustion point. There were many close calls.

Often we would find our route blockaded by heavy German forces holding the towns and main roads. Then with the help of peasants and local guerrillas, we would find some back pass through which we could slip through at night. More than once we were fired on, and on one occasion we were completely scattered until we rejoined each other the following day.

TH E greatest difficulty faced was in crossing the main rivers, since we needed either a boat or bridge, both of which were usually held by the Germans. At Gorazde, we finally resolved the situation by my dressing up in peasant clothes and walking across the Drina River bridge with a group of peasants right under the eyes of the German guards and soldiers holding the town. At this time, I myself had a beard so that I felt quite confident that we would get across without trouble, as we did. As we reached the coast near Trebinje, I ran smack into a German patrol on a mountain trail. They fired on us. We were forced to withdraw ten hours and frantically skirt the region for two days.

Crossing through Herzegovina toward Dubrovnik on the south Dalmatian coast, I found that the Chetnik guerrillas here did not measure up to the Serbian standards. The guerrillas in Herzegovina were softer and more concerned with their civil

war against the Partisans than the fight against the Germans. We passed town after town which had been destroyed or burned down by Germans, Partisans or Chetniks. The country was poor and the people starving. Here I began to see evidence of large Partisan guerrilla forces. When we came close to them, my small force would become panicky, with the result that we would withdraw and search for a new, safer route.

At last, I had my first view of the Adriatic Sea, from a mountain near Dubrovnik, Dalmatia. It was a cheering sight, but the greatest hurdle lay ahead. We must find some way to get across to Italy; capturing a fishing boat would not be as easy as it sounded. The Germans kept a close control over all craft, operating plane and sea patrols up and down the coast and posting garrisons and coast artillery emplacements along the shore. Furthermore, we were now in hostile territory, where the people were not as sympathetic as in Serbia. We had to watch ourselves carefully, find safe villages to stay for the night and post an extensive guard. The Gestapo at Dubrovnik knew I was in the vicinity and to prevent our being surprised I had to change our location each night.

Maj Bacevich, the local guerrilla leader, assured me that he knew of a small sloop, with sails, motor and gasoline, which he could capture. A force was prepared and we started down to take it but promptly ran into a local German detachment. After a short engagement, we were driven back.

My hopes were now dying fast and it looked as though I must make the dreary hike back over the mountains to safer territory. I learned through the grapevine that Col Seitz was now stuck with Partisan guerrillas back in the Sandjak region, inland.

IT WAS at this low point, while we were hopping around from village to village to throw the Germans off our trail, that we received a report that there was a British officer about three days to the north. I sent out patrols to investigate. The report was confirmed and I went to meet him. Who should I meet, but Col Bill Bailey, my old friend, whom I had not seen for several months!

It was a joyous meeting. He advised that he was trying to do the same thing as myself. Most important of all, he had his radio transmitter with him, but the battery was dead and he had not contacted Cairo for weeks. We enlisted the aid of the guerrillas to send down a peasant with the dead battery to the German-occupied city of Trebinje in order to see if he could get it charged.

Our plan was to request Cairo to arrange with the Navy in Italy to pick us up at night by submarine on the coast. One of the guerrillas, a former lieutenant in the Yugoslav navy, knew the coast well. He, with some others, dressed as peasants, made a reconnaissance and found a safe little cove just below Cavtat where the water was deep and there were no coastal defense forces. The nearest



Camp site of Capt Mansfield's OSS Mission.

German station was about three or four kilometers to the north.

Our first bad break came with news that the peasant had been seized in Trebinje and both peasant and battery lost. Through guerrilla contacts in the nearby cities, we tried to get another and finally were rewarded when the guerrillas appeared with a big, old-fashioned 12-volt type which they had stolen from a railroad car.

That night we waited feverishly for the 8 p.m. schedule, wondering whether Cairo would come up after all these weeks of silence. Within ten minutes after we had started pounding the key on the first of our five crystal frequencies, Cairo came up! The operator was so excited that he put us off a half hour while he contacted headquarters. We radioed our plan, giving the coordinates of the rendezvous spot. On the following day, Cairo advised us to be at the rendezvous two nights later between the hours of 2000—0100 and flash two code letters out to sea five times every ten minutes. A surface craft would appear and take us off.

On the 10th day of February, two nights later, we started out at dusk over the mountains for the point on the coast, which was six hours away by foot. In order to get to this point we must cross the main coastal railroad and two main motor roads, through hostile territory, well-populated with Germans. It was a bitter night, with rain and sleet sweeping at us. We left radio and all gear behind and selected a small group of ten with a loyal peasant guide who knew the way.

REACHING the mountain range overlooking the coast, we descended slowly, feeling our way in the darkness, to the two-mile plain extending out to the water. From the side of the mountain, we could occasionally see the flash of automobile lights along one of the main roads and the lights of Dubrovnik, nearby. The terrain was almost impassable. After cutting ourselves and stumbling down rocky ledges, we wallowed through fields of mud. Our hearts pounded as we waited in a ditch near the main road and, when the road cleared, two at a time sauntered down the road for a hundred yards to a point where a trail led to our destination. Next we were pushing through brambles, scratching ourselves badly, in the pitch darkness. Finally we reached our destination.

One look at the water and I knew that we would never get off that night. It was a thundering sea, crashing up 30-foot breakers against the rocks. For three hours we sat on the rocks, flashing my little German torch out to sea as directed, and freezing. Nothing happened.

What next? It was now 2 a.m. Our native guide came to the rescue, walked us back about a mile and hid us in the attic of his house, located in a

little coastal village. For two days we hid there, right in the middle of the Germans. Through the shutters we could see them, from time to time, in the distance. Food was brought up to us by the old man and his two daughters. We found it difficult to keep the prohibition of strict silence which we had imposed on ourselves. When someone would enter the room below, everyone held his breath.

THE bad weather continued. Under cover of darkness we stole out the next night and tried once again, without results. On the third night we made our way with great difficulty back up the mountains. Everyone was discouraged.

Contacting Cairo the following day, we arranged another rendezvous for the next night at the same spot, which we felt had not yet been compromised. New torch signals were assigned. If this did not work out, we knew that we were now too hot to remain around much longer. On the following day, the weather cleared, and once again we went through the tortuous process of getting to our rendezvous point, this time being plagued by barking dogs.

Standing on the rocks, we took turns flashing out the letters “—.” “—.” (RN). We were there only 20 minutes when someone heard the low hum of a motor somewhere out there in the water, but we could not see it. Worried as we were over the possibility that it was a German patrol boat, we kept flashing. Finally we all spotted it at once, about 300 yards off shore! Now we were too excited to contain ourselves.

As it drew nearer we could see that it was a large craft. (It later turned out to be an ML2, British-type PT boat.) Before it pulled up to stop, a dinghy was slung over, and we could see its muffled oars splashing as it made its way into shore. We all gave a soft cheer! We quickly leaped down the rocks to a point where it could take us off and flashed our light. As it pulled alongside, we made out two British sailors with two passengers. The passengers, a British naval officer and American army captain, leaped up on the rock, pistols drawn. We identified ourselves and the first load was now being rowed out and soon was climbing up the cargo.

Within 15 minutes, Col Bailey, Capt Todorovich, five bearded Yugoslav guerrillas and myself were aboard. Allied territory at last! We now felt as safe as bugs in a rug, and didn't give a damn what happened. Not so, however, the crew. All around us, sailors were tensely manning their machine guns.

As we shoved off and waved goodbye to our peasant guide, I wondered whether we at home would ever risk our lives for others to the extent that these peasants and guerrillas had for us. END

Air-Mining Rabaul's Flak Alley

The

story of a group of Marine fliers who faced almost certain death to cripple a Jap stronghold which might have turned the tide of war in the South Pacific. By Lt J. Davis Scott, USNR

THIS is a story that couldn't be told when it happened for security reasons, but it has lost none of its fire in the waiting. It's the story about a memorable aerial mine-laying expedition against Rabaul—one of the strongest blows struck in the campaign against the Japs in the Southwest Pacific. And it's the unforgettable story of a group of Marine fliers who faced almost certain death in a desperate gamble—and won.

The mission of these Marines was to sow death—in the form of aerial mines—across the entrance of Rabaul's mighty Simpson Harbor, the Japs' greatest supply and naval base in the Southwest Pacific. Rabaul was more important than Allied intelligence ever imagined.

After the Japanese surrender, Allied reconnaissance teams discovered that Rabaul was more powerful than Truk—thus rating it as the Japs' No. 1 base outside the homeland. Outstanding among its features were mighty underground tunnels stacked high with equipment and supplies. These tunnels held more than 1,000 tons of battle rations, nearly 3,000 tons of clothing, 590 artillery pieces, 700,000 shells, 330,000 grenades, 56,000 anti-tank bombs, 20,000,000 rounds of ammunition, 19,000 bombs, 100 anti-aircraft guns, 87 tanks, 1,000 trucks, tens of thousands of drums of gasoline, and at various times large numbers of planes.

From Rabaul, the Japanese planned to launch a sweeping conquest south and eastward. A Wellington (New Zealand) dispatch to the New York *Times* states that maps and charts found on Bougainville after the surrender indicate that "The Japanese plan after the consolidation at Rabaul, was to secure the Solomon Islands and then hit at New Caledonia, after which the enemy would have invested New Zealand, Fiji and possibly Samoa and the surrounding isles. At the same time Australia would have been attacked."

THE first group of Marine-manned TBF Avengers was to strike Rabaul at 0200, the second 70 minutes later at 0310, and the third at 0415.

There was some reason for the hope that the initial group of TBFs might surprise the Japs, but it seemed certain there could be no surprise by the time the second and third units arrived. There would be a solid wall of blazing ack-ack, ship and shore fire and blinding searchlights to smash through. And because the mines had to be sown with precision, evasion was virtually impossible.

The 69 flying marines, 23 pilots and 46 aircrewmen, received their first hint of the mine-laying

assignment's toughness when they were called together for the briefing session in the ComAirSols strike command intelligence tent on Bougainville.

A little more than 12 hours later, 18 of these marines were to be listed as "Missing in Action." But by the time that the last Avenger roared away at 0430, Rabaul's great harbor would have died a violent death. The mines would have locked Japanese ambitions for further conquest securely within the harbor—there would be few Japs pushing on from there.

Rabaul was not a new target. For weeks these pilots had been thundering in and out of Simpson Harbor blasting enemy shipping, wharves, airfields, AA guns, and everything else that popped into their sights. Once, they had caught two Jap submarines surfaced within the harbor and had blasted them with rockets, bombs and .50-calibres. Most of the pilots could draw you a map of Rabaul and its harbor from memory—and not miss a single detail.

ON all of these strikes, the Jap stronghold had always offered the toughest of opposition. The ack-ack was accurate and intense. Not a few Marine airmen had lost their lives. This time, however, Rabaul would be tougher than ever.

Aerial mines must be sowed accurately to produce the desired results. There can be no quick dive and pull-out. Every Avenger had to come down almost on the water—and then release the parachute mine carefully in order to drop it into the exact spot. The mission's objective called for the complete blockade of the harbor entrance.

The sowing is done in much the same fashion as a farmer sows. But in contrast to the farmer seedling in a peaceful, sunny acre, the Marines had to do their sowing in an inferno in which sudden death was a part of every enemy missile.

Only once before had these Avenger pilots sown aerial mines in enemy waters. That was about two months previous when this same squadron mined Buka Passage between Bougainville and Buka. All had survived that assignment, but all knew that it couldn't compare with the mission to come.

The mines were to be laid in three patterns. Maj. Royce W. Coln, squadron commander, was to lead nine planes in an east to west seeding assignment. The unit headed by Capt Bob Milling was to sow mines along the east shore, and Capt Floyd Haxton's group was to seal the harbor with a west to east run.

There was an unusual air of expectancy about the squadron long before takeoff times. Eight of

the pilots tried to forget the mission by playing a gin rummy game for the "championship of the universe." Others spent their last hours relaxing, writing letters, reading, "shooting the breeze," or going over little details in their assignments. The ordnance men were kept busy loading the mines while the mechanics gave the planes a final once-over.

It was shortly after midnight when Maj Coln called his group together for a few words. By 0030, the first eight TBFs were enroute to Rabaul. It was a little before 0200 when blacked-out and battered Rabaul could be recognized up ahead in the hazy moonlight.

Swinging north, Coln led his flight over Cape St. George and then quickly dropped to a few feet off the water in an effort to achieve surprise. Rabaul was still dark and quiet as the planes sped by Duke of York Island.

But the hoped-for surprise was not to be realized. Suddenly, as if the Avengers had tripped the switch, two dozen enemy searchlights flicked on. The Jap garrison galvanized into action—and the oncoming planes were caught in a blaze of lights as bright as the noonday tropical sun.

No time for anything now. The job had to be done. Ack-ack ripped the skies and the tracers appeared to be moving directly into the flight path. The Avengers pulled over the 736-foot extinct volcano to the right of the harbor, their fat lethal-filled bellies barely clearing the jagged edges of the crater. A quick turn and they were ready for the run.

1st Lt Jack Sloan was blinded by the lights and barely was able to get his plane back under control. "The lights resembled huge claws," Sloan remembers. "They seemed to be reaching out everywhere in an effort to pull you down." Maj Coln found the only way he could escape the terrific glare was to press his eyes almost against the instrument panel—and to trust nothing but the dials and needles.

SOMEHOW, Coln's first section got through—sowing its mines accurately. The second section had no such good fortune. A burst of ack-ack came dangerously close to the plane of 1st Lt John F. Barthoff just as he was turning in for the run. Suddenly his plane disappeared in the darkness—whether it crashed on the airfield below or into the harbor could not be determined. With Barthoff went his radioman, PFC Ray Largo, and his turret gunner, StSgt Joe Sullivan. The others rumbled through the slot unscathed.

In a few seconds, the first group had completed its assignment and the seven planes turned homeward toward Bougainville's Piva airfield. The second group of eight TBFs led by Capt Milling was already on its way to the target.

Aroused by the first attack, it seemed as though all Rabaul was waiting when Milling started his

run at exactly 0310. How anyone in his group ever got through was a miracle.

What happened to 1st Lt Alonzo Hathway and his crew baffled his mates. His TBF just disappeared. There were no flames, no crash—at least none that anyone saw. With him were his radioman, PFC Willie Thompson, and the turret gunner, Corp Johnny Edwards. Two weeks later, 4,000 miles away in Los Angeles, Calif., Hathway's wife was to give birth to their first child, a son.

1st Lt Hugh L. Cornelius must have been blinded by the searchlights. His plane took a crazy turn and started down swiftly. Some said it seemed as if he landed in the harbor but none was positive. The two Eds—St. Germain and Slipkas—were the crew members in Cornelius' plane.

ALTHOUGH battered and buffeted by the flak, the other six planes in Milling's unit managed to get through and turned homeward. Now the harbor had been mined from east to west and along the east shore—and Haxton's group, already on its way, would complete the job.

Rabaul was tough for the first two groups and those who had survived had needed more than prayers, luck and extraordinary flying skill. No words, however, could accurately and adequately describe the Jap-held bastion by the time Haxton's seven-plane group moved forward to attack. The aircrewman who said it was a "six-ring Hell" came close, but even that vivid description fell below the mark.

The Japs had figured almost exactly where Haxton and his men would have to release their mines—and the brilliantly lighted alley was cross-fired with ack-ack. Flak and tracers laced every square foot.

Haxton's section came roaring in on one of those devil-may-care runs. Flanking him were his wingmen, 1st Lt Jimmy Fowler and 1st Lt Robert W. "General" Sherman. It was a trio of topnotch pilots. Only four days before, Sherman in a day-time strike on Rabaul had destroyed three Zeros by expertly dropping his bombs on them just as the Nips were taking off to intercept him.

The Haxton-led trio swung in over the harbor and started its west to east sky sprint. Sherman was the first to do down. With him went PFC Bill Cashman, radioman, and Sgt James W. Greene, Jr., turret gunner.

Fowler was next. The Avenger went out of the formation and into the darkness outside of searchlight alley. Two privates, Johnny Pudil and Cecil White, were his crew members.

Although his wingmen had fallen victims to the enemy and he was a lone target in the center of the enemy-held stage, Haxton managed to complete his run, release his mine and get out of the area with his TBF still functioning. He had no time to look back. He made a quick turn and roared away to Bougainville.

Capt Laverne W. Gonnerman brought the next

section in. 1stLt Mike Savino was flying one wing and 1stLt Jimmie Boyden was on the other. With ack-ack, flames and searchlights filling the sky, the harbor was an eerie sight as Gonnerman squinted ahead.

Gonnerman and Savino smashed through, but Boyden didn't. An AA shell may have hit his plane. It seemed to pause in mid-air and then went out of the vision range of his mates. The names of Boyden and his two aircrewmen, PFC Art Patrickius and PFC Bernard Pardun, were added to the list of "missing in action."

That left one flier. He was 1stLt Byron "Rip" Radcliffe. Because he was the last man in his group, Radcliffe had to make the dash alone. He came roaring in. Then just as he was about to release his mine in ack-ack street, one of the enemy lights swung its beam directly into the cockpit. He was blinded. Luckily he did not crash, and somehow he managed to get out of the danger zone.

However, he had a job to do and he was determined he was going to do it. He retired into the darkness and prepared to make another run. First, he called his radioman and gunner, explained the situation, and asked them to vote whether they should return to drop the mine. The vote was unanimous for the return. Radcliffe turned and came back again, this time releasing his mine. It was a miracle that they lived through that second run.

Maj Coln's group reached Bougainville at 0335. Capt Milling and his survivors landed a few minutes before 0500. An hour later the remainder of the group was safe at the Pica airfield. Radcliffe, the one-man attack team, ran into a terrific storm on the way home and had to fly instruments nearly the entire route.

Lt James N. Truesdale, USNR, who taught Greek at Duke University before the war, took down the stories and compiled what was truly one of the most unusual and exciting of the war's aviation intelligence reports.

Cornelius, Barthoff, Boyden, Sherman, Fowler, Hathway—the pilots—were recommended for the Distinguished Flying Cross, and the crew members—St. Germain, Slipkas, Largo, Sullivan, Patrickius, Pardun, Cashman, Greene, Pudil, White, Thompson and Edwards—were recommended for the Air Medal.

END

China Marines Returning

BRIG GEN Gerald C. Thomas, director of Division of Plans and Policies, has brightened the hearts of thousands of overseas veterans in announcing that more than 10,000 Marines now stationed in China would be returned to the States early in 1946.

Directing his remarks to the First and Sixth Marine Divisions in the broadcast beamed by short wave to overseas stations, Gen Thomas said:

"Here is good news for you high-point Marine veterans over there in China. We already have sent 10,000 new men out to replace you. The first draft of 1,000 should be arriving by now and two drafts of 5,000 and 4,100, respectively, are rapidly nearing China."

Gen Thomas said that as of 21 December a total of 176,834 marines had been returned to civilian life since V-J day. The total was 47,608 ahead of schedule.

Gen Thomas explained that in addition to returning high-point men of the First and Sixth Divisions from China, veterans of the Fourth Division had all been returned to this country and the division deactivated. All high-point men of the Third Division have been returned, he said, and the Fifth Division, composed of all high-point men of both the Second and Fifth Divisions, is now in the progress of returning for deactivation.

High-point marines, who are not members of regular divisions, are being returned home as fast as transportation is available, he said. Gen Thomas said the Marine Corps was striving to cut back to a peacetime strength of 100,000 enlisted men and 9,000 officers by September, 1946.

Hospitals Come in Packages

With bulldozers and other heavy engineering equipment to clear the site, building a hospital is now only a question of days. New prefabricated buildings have been so arranged that they can be erected easily by regular engineer troops or unskilled labor to fit the site or any size necessary. The standard designs are grouped in three classes: metal, pre-cut, and wood. A tropical design embodies such features as continuous windows, ventilators at the base of the side walls, and eave overhang to carry off tropical rains. An insulated type, for cooler climates, has a minimum of windows, gable or ridge ventilators.



Carbine

The surrender of Japan did not settle long arguments on the relative merits

Since the advent of the Cal. .30 M1 Carbine as a standard arm for U. S. forces, there has been—and undoubtedly will continue to be—a reasonable amount of haggling over the relative merit of that weapon and the .45 automatic pistol. Arguments have concerned ballistic differences in the weapons, facility of operation and ease of training as well as general overall effectiveness. Proponents of the one weapon may remain unconvinced of the merits of the other, regardless of the arguments presented for each.

The carbine has never been intended as a substitute for the pistol. It is a specially designed, light weight weapon for those whose duties do not require delivery of the maximum amount of fire power from their individual weapon.

Outlined below are the principal characteristics of these two weapons, by which a

The versatile carbine was often employed to help clear the Japs out of their caves.

U. S. Carbine, Cal. .30 M1 and M2

Wt. of fully loaded gun (lbs)	Magazine Capacity (rounds)	Max. rate of Aimed Fire, not considering mag. changes (Rds per min)	Sustained Rate of Aimed Fire	Max. Range in yds	Max. Eff. Range in yds	Freedom of arm movement in carrying
5.75 (M1)	15 (M1)	30 (approx) (M1) Cyclic Rate—750 (M2)	According to individual			
6.25 (M2)	30 (M2)			2200	300	Limited

Wt. of projectile (grains)	Muzzle Velocity (f/s)	Energy* of projectile at max. eff. range (ft-lbs) (at 300 yds)	Sight Radius (inches)	Type of Sights	CinCPOA u/f (rds)	Penetration Power* (inches of pine at 10-15 ft range)
110	2000	275	21.4	Adjustable or Fixed	46 (M1) Undecided (M2)	16.86

*This is not shock power

Carbine or Pistol—

of these weapons, but this information may keep all such controversies factual.

quick comparison of them may be made, and any previous individual opinions either confirmed or questioned. It is to be noted here that the characteristics shown for the carbine include those for the selective-automatic M2 carbine, where different from the M1. The M2 is now being furnished to field units as standard issue, gradually replacing the M1 as it becomes unserviceable.

Weighing the comparative figures which appear in the two charts, consider all possible situations in which you must take your enemy where you find him and fight it out—fight it out to a finish, with no holds barred, and at any battle range. Would you, armed with a carbine, feel confident in seeking combat with an enemy armed with a pistol? Or, armed with a pistol, would you feel any more confidence in seeking combat with an enemy armed with nothing except a carbine?

The pistol is not just a close quarters weapon. It has its place in open combat. →



U. S. Pistol, Cal. .45 M1911 or 1911A1

Wt. of fully loaded gun (lbs)	Magazine Capacity (rounds)	Max. rate of Aimed Fire, not considering mag. changes (Rds per min)	Sustained Rate of Aimed Fire	Max. Range in yds	Max. Eff. Range in yds	Freedom of arm move- ment in carrying
2.75	7	40 (approx)	According to indivi- dual	1600	25	Complete

Wt. of projectile (grains)	Muzzle Velocity (f/s)	Energy* of projectile at max. eff. range (ft-lbs) (at 25 yds)	Sight Radius (inches)	Type of Sights	CinCPOA u/f (rds)	Penetration Power* (inches of pine at 10-15 ft range)
234	802	317	6.5	Fixed	14	5.25

*This is *not* shock power



Brig Gen A. H. Noble and other American officers helped train Netherlands Marines.

The Determined Amphibian

The Dutch needed a modern amphibious fighting force so they turned to the U. S. Marine Corps for guidance in its building.

By Maj E. J. Baron Lewe van Aduard

AS a young Marine officer back in 1935, I wanted to enlarge my knowledge of amphibious operations and searched in the libraries for material on this subject. The history of warfare had a lot of interesting landing operations to be studied. However, as a marine I was disappointed in finding in military and maritime periodicals no studies about future amphibious operations. On the contrary, the majority of contemporary writers considered the landing operation an obsolete event in which only the historian could have any interest.

Several writers set forth elaborate proofs based on the lessons of Gallipoli and other landing operations of World War I that the development of automatic weapons and other defensive arms would render any such operation a complete failure. In particular, the authors on air warfare seemed to be convinced that the all-purpose air weapon would smash any landing fleet long before the troops would have the opportunity to try a landing. In their opinion, the results of air bombardment would be decisive in any landing operation which man-

aged, by some mysterious manner, to have even some original success. Even the strategic basis of the defense of countries with a vulnerable seashore was founded on the conception of "no landing operations." No, the ambitious Marine officer could find no indication that any large landing operations could be expected in the future.

Then, to my astonishment, I unexpectedly found an elaborate article on landing craft and landing operations in a copy of the United States Naval Institute Proceedings of 1935. Only a very few times in far-away Europe had I heard of the U. S. Marine Corps. But through this article, I learned of the existence of a large brother Corps; not only that, I also learned of the existence of a group of military and naval specialists who considered the amphibious operation to be a real possibility in future warfare. I was amazed to find that at some bay in America, with an unpronounceable Indian name, written "Quantico," U. S. Marines were practicing landing operations and were improving new type speedy landing boats and devising armored

landing craft. How gladdened was a real Marine heart by the thought that students of amphibious warfare were, after all, seriously considering the possibilities of future landing operations. The eager study I made of this article resulted in my developing an active interest in the organization of the U. S. Marine Corps, but my course of duty delayed further acquaintance with the particulars of this Corps. However, the whole world was soon to hear much of the U. S. Marine Corps and amphibious operations.

With the treacherous attack of the Japanese at the end of 1941, the Japanese quickly enlarged their empire to the south. The Japanese forces spread out over Malaya, the Philippines, and the Netherlands East Indies, and a chain of island bastions secured their victories.

In 1942, the most serious threat to break the Allied communications between the west coast of the United States, Australia and New Zealand was imminent. The Japanese island-hopping had conquered Guadalcanal Island in the Solomon group as a take-off base for further southward operations. The holding of this island was considered one of the decisive factors for a successful campaign in conquering the southern continent.

At that moment, the United States struck back with that part of her forces which by history and by organization was and is the only part of the American armed forces which can and may strike at any unexpected moment by land, by sea, and by air—the United States Marine Corps.

In the reconquering of Guadalcanal Island, all the determination and belief of this Corps in future amphibious operations was repaid. All the thorough training for this difficult type of warfare showed its results. All the elaborate studies made on this matter proved their value in practice.

THIS Battle of the Solomon Islands must be considered the turning point in the Pacific war. The defensive attitude of America changed to one of offensive, as should be the case when the Marine Corps enters a fray, for this Corps is built on the theory of victorious attack in amphibious operations. This has been proved by the long line of battles in which the striking forces of the U. S. Navy conquered the stepping-stones which led to the ultimate victory over Japan—Bougainville, Tulagi, Tarawa, the Marshall Islands, Iwo Jima and Okinawa.

The students of warfare in the period before the last global conflict have been mistaken in their estimate of the landing operation, and it may be stated as a fact that the U. S. Marine Corps has been the military organization, which by its continuous study of this type of warfare, made available to the Allied nations at the beginning of the war a sound theory

and a well-trained organization for this type of work which was found to be of the highest importance for Allied victory.

In the fall of 1942, the news of the Guadalcanal battle reached England and revived all my former interest in the U. S. Marine Corps. The commanding officer of a small U. S. Marine detachment, serving as embassy guards in London, gave me some material on the history of his Corps.

CONCURRENTLY, plans for reorganizing the Netherlands Marine Corps were under consideration by the Netherlands naval authorities. It was planned to train larger Marine units after the liberation of Holland than the Corps had known before this war. And I believe that the historic Guadalcanal battle was one of the decisive factors which led to the decision to petition the American authorities for permission to train nucleus forces for this modernized Netherlands Marine Corps at the training schools and facilities of the U. S. Marine Corps.

In connection with these plans, permission was obtained to send a few Netherlands Marine officers to the Marine Corps Schools at Quantico in the summer of 1943. There they learned and appreciated the thorough preparatory studies made by the U. S. Marines in solving the problems of so complicated an operation as a modern landing, and as a result of this first contact more definite plans were made to train Netherlands Marine forces in the United States.

In the fall of 1943, more Netherlands Marine officers were allowed to follow courses in the United States. By the end of that year, a few hundred enlisted men had been assembled here from all over the world—from Curacao, from Surinam, from the Netherlands Navy in Australia and Colombo, from the Netherlands Navy in England, and escapees from Holland—to be trained as instructors for new Netherlands Marine units. One could find them at the rifle range and the engineer stockade at Camp Lejeune, at the artillery and ordnance schools at Quantico, at Camp Pendleton, where they developed their technical skill in tank handling, at communication schools, and at several other U. S. Marine Corps activities scattered all over the States. One of the most outstanding undertakings was that of officers' training. Following the prescribed U. S. Marine Corps courses at OCS and the ROC at Quantico, several Dutch candidates were commissioned reserve officers in the Netherlands Marine Corps.

Probably because they came from so many different countries, these Dutch Marines picked up the English language very quickly and felt at home among the American Marines. An inestimable amount of knowledge was accumulated by this relatively small group of future instructors, and a sound basis was laid for the creation of new units. After

thorough consideration, the United States authorities had agreed that these larger units could also be trained at U. S. Marine Corps training centers.

In the fall of 1944, Col M. R. de Bruyne, Netherlands Marine Corps, was appointed as the future commanding officer. Plans were made for recruiting the necessary personnel for the new units, and before the end of 1944 the main body of the nucleus cadre had been returned to Europe for recruiting purposes. A large group had preceded them in the spring of 1944, gaining valuable battle experience by participating in the Normandy landings and the European campaign in recovering France, Belgium and the southern part of Holland.

Most unfortunately for the earnest desire of the Netherlands to participate in the war against Japan, the liberation of the Netherlands homeland was not accomplished until the spring of 1945. After that date, thousands of Netherlands volunteers expressed their wishes to become American-trained Netherlands Marines and were sent to the United States. Camp Lejeune became the main training center for the Dutch, and the name of this camp and the U. S. became practically synonymous to many families of Marines in Holland.

During training hours, there was not much to distinguish Dutch recruits from American recruits, and in leisure hours only the red badge on the left shoulder carrying the legend "Netherlands Marines" and the different Corps emblems distinguished the two nationalities.

Gen A. H. Noble, USMC, was appointed as the United States commanding general of the Netherlands Marine unit, and became the highly respected

chief of training for the Dutch. All indications pointed toward the speediest formation of a modern Netherlands organization.

The end of the war with Japan necessitated a change of plans. However, as any seafaring nation, the Netherlands Kingdom needs an ever-ready, modern, trained Marine Corps and therefore, as a basis for the reestablishing and reforming of the Netherlands Marine Corps, the training given the Netherlands Marines by the U. S. Marine Corps will be of inestimable and everlasting value.

The Netherlands Marine Corps has had the pleasure and the privilege to work in close contact with the U. S. Marine Corps in implementing these plans for the organizing and training of Netherlands Marine Corps units. This acquaintance with our brother Corps has assured us that no military organization has fulfilled its mission better than the U. S. Marine Corps—its mission of immediate availability, with highly trained forces, for any operation by sea, air, or land, wherever called for in the world.

We are sure that the well-known slogan, "The Marines have landed; the situation is well in hand," will remain forever as the typification of the United States Marines. We know that the Marine Corps, through the skill of its officers and the training of its men, will maintain its value as the first-line striking force of the United States, no matter what changes may occur in the development of modern warfare.

Let us hope that the ties woven between the U. S. Marine Corps and the Netherlands Marine Corps may endure forever.

END

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"Rock" Morale

Our garrisons in the Pacific pose a big problem

for officers; men no longer want to adapt themselves to hardships and privations they accepted when the war with the Japanese was still on.

By LtCol C. L. Banks

THE subject of morale has been of great importance to the armed forces during the war and has become of even greater importance since the cessation of hostilities. In the Pacific, there are a great number of islands, called by many servicemen "rocks," which must be garrisoned indefinitely for our future security. The Island of Oahu is known as a "rock," as are many atolls that are but pin points on the charts.

On some of the bigger islands, a comparatively large number of troops will be stationed, and on these, the construction of permanent installations is well under way or near completion. The morale problem on such islands will not be as difficult as that on these small atolls where facilities in the initial period will be limited. The discussion that follows will be applicable to both types but will be more concerned with the latter. There is no city of Honolulu on Marcus, nor is there a Hoover Park on Chichi Jima.

The problem of morale has greatly increased with the peace in that certain hardships and privations accepted in war time by the officers and enlisted men as necessary for the defeat of Japan, are still present although the spirit of having to crush a deadly enemy no longer exists. Thoughts now are of home and how soon it will be possible to get back to the "States." There is no harm in thoughts and desires like this if the men are kept reasonably busy in fairly pleasant surroundings. In such cases, morale will be high. It is only when living conditions are poor and there are excessive amounts of leisure time with nothing to do that morale drops rapidly.

IT IS assumed that the majority of these islands will be garrisoned by regulars and low point personnel. However, it will be difficult to keep morale high unless every officer concerned gives this problem his closest attention and thought. The company officer is just as concerned with the morale of his platoon or section as is the commanding officer concerned with the whole unit.

Morale of a command is the definite responsibility of the commanding officer in war or peace, no matter how large or small the command. He, with the assistance of members of his command, has the responsibility of keeping morale as high as possible under all conditions. Personalities of the individual commander and his subordinates of course will have a definite influence on the men under them, but if certain, almost self-evident, principles are adhered to, the problem of maintaining

high morale should be one that presents no great difficulty.

It is said that a way to a man's heart is through his stomach and this is as true in a military unit as it is in a domestic household. Therefore, the first and probably the most important part of this discussion will deal with the mess.

WITH demobilization, a large number of mess personnel have left the service. You may find that in your detachment of 250 men that your mess sergeant is a corporal with six months' experience in the commissary branch. Six months ago, you probably would have thought that a man with such limited experience would not be able to supervise the operations of a mess with any success. In order to handle such a situation, it is necessary that you pick one of your best officers for mess officer. This will probable have to be his regular duty and not an additional duty as is so often the case. Although an experienced officer is desirable in this type of duty, you will probably find that the prospective mess officer will have little, if any experience in this type of work. He can learn a great deal from studying publications on mess management, preparation of food, and other written matter on this subject, but good common sense is one of the best attributes of a good mess officer.

The mess facilities at the start will often be very unsatisfactory but as constant improvements are made, the standard of the mess will likewise improve. The use of paint serves not only to enhance the appearance of the buildings, but assists in keeping high sanitary standards as well. Painting of the interior of the mess hall and galley also adds a great deal. Consideration should be given to make the galley as agreeable and pleasant a place to work in as possible. Good lighting, proper ventilation, and the correct installation of galley equipment are a few of the more important things to consider in order to get maximum efficiency from the galley personnel.

The preparation of the food is very important, and will take constant supervision at all times by the commanding officer, medical officer, and the mess officer. Though inexperienced, mess personnel can all learn by attending school. By holding properly conducted classes and practical instruction, they can be taught the proper preparation of food in a fairly short period of time.

Monotony of the menu is one of the biggest "gripes" of all personnel. Even T-bone steaks are monotonous to most if served day after day, but

probably not as much so as Spam. It is important that a constant check is kept on the menu to insure that a maximum of variety is obtained. In most cases, one will find that the smaller the mess the better the preparation of the food, but there is no reason that the food cannot be prepared in a large mess as well as a small one if properly supervised. Suggestions from the men eating in the mess should be encouraged at all times.

Often excellent preparation of food is spoiled by improper serving. If the men eat in a clean, light, airy, mess hall, with the food served in clean gear on a clean table with conditions as close to "Stateside" as possible, the rating of the mess will be a high one even if Spam does creep into the menu from time to time due to the limited quantity of fresh stores. It is important to impress on the men to act in the mess hall as they would in their own home, otherwise the problem of keeping the mess clean will be a difficult one.

NO ONE likes to be served by a dirty person in a grimy uniform with a mop of hair hanging in front of his face. Messmen must have haircuts, clean hands, clean fingernails, and the proper uniform; they must be required to take pride in their personal appearance. The above may be accomplished by frequent inspections, close supervision, ingenuity and high standards in the preparation of the food, and certain basic common sense that is applicable to mess management as to a command in general.

It has been said that a good outfit never came out of a sloppy camp and likewise that a poor outfit has never come out of a neat camp. The outward appearance of the camp is very important. During peacetime, a certain amount of "spit and polish" is required that is not always practical in war time. The camp or barracks area should be very carefully laid out. Future expansion and development should be considered at the beginning so that the area does not grow "like Topsy" without rhyme or reason. Very often drainage is not given proper consideration and study, with the result that the area may be fine in the dry season but will become practically unliveable in the rainy season. It is easier to construct a proper drainage system early in the camp development than later on.

The men should be encouraged to take pride in their area and be given as much time as possible to improve the appearance of their living quarters and the area that surrounds them. Uniformity is something that has long been considered by all commanders as essential in the lay-out and the construction of the camp. Grass, flowers, and landscaping play a large part in making the men take more interest in their camp and their own particular area.

A closely supervised athletic and recreation program is another method to insure high morale. For years to come, many island garrisons will not have elaborate swimming pools, surfaced tennis



Alex Raymond

Good chow is an ally in maintaining morale.

courts, and other facilities that are considered necessary for a proper recreation and athletic program according to mainland standards. With thought, ingenuity, and hard work, satisfactory facilities can be provided with the minimum of materials and equipment. An athletic program requires supervision by an officer and certain enlisted assistants, and the cooperation of the whole command. The extent of the program will naturally depend on the facilities available, the size of the command, and the time allotted. Such games as volleyball, handball, and horseshoes are examples of recreational facilities easily established. In most cases considerable time will be made available for athletics but the actual athletic program will not be discussed here because there are many excellent manuals and pamphlets that have been published on this subject.

Caution must be observed to keep athletics organized. Disorganized athletics is almost as bad as none. The introduction of new games and a constant variety of sports in the schedule serves to prevent the men tiring of any one game. Probably the most essential things to assure the success of a good athletic program are complete cooperation, proper planning, and a certain amount of publicity or "buildup." The more interest aroused the greater the success.

CLOSELY related to the athletic program are the recreation facilities that are made available to the officers and men. An air conditioned theater showing the first run movies; a complete post exchange with a fountain and complete beer dispensing facilities; and a modern, elaborate recreation room are things that would make the job of a recreation officer on an atoll easy, but in most cases he will have none of these.

Movies are undoubtedly the most universally appreciated recreation facility that can be offered the men. It is important that the theater be se-

lected with care whether indoors or out. The seats should be constructed so as to be as comfortable as possible and located to assure that no seats are out of range of the sound equipment. If the movie area is made as pleasant as possible, the men on seeing a picture for the fifth time, will enjoy it to a greater degree. Movie operators that are properly trained are essential. A show that breaks down every 13 minutes leads to a disgruntled audience. Proper adjustment of the sound equipment is another thing that should be carefully looked into. A well prepared news program before the movie is a good practice that should be given careful attention.

The amount of talent in even a small unit is often surprising if the right methods of promoting interest in amateur theatricals and entertainment are used. Almost all groups have sufficient singers to develop a good chorus or quartette. It has always been found that men are happier when they entertain themselves.

An attractive library that lends itself to reading and browsing is another important recreation feature. It may be an old shack or even a tent but with a little imagination and practical work wonders can be done. It is important to get as many good books as possible before embarking and to make arrangements to have a resupply furnished at frequent intervals. Reading is a pastime enjoyed by nearly all and if promoted by a pleasant, quiet place to read, it can do much to keep morale on a high plane all by itself.

ALONG with the library a recreation room should be constructed. How complete and how elaborate it will be depends on facilities and materials available. It should offer the men a place to go to get away from their tents to write letters, play games, and just relax. Here again, a certain amount of supervision will be required to get the place off on the right start. Certain types of programs can be integrated with the recreation room. In other words it should not be just a place for poker games and rowdiness.

Education is another good way to use time that will produce results. "Getting ahead" is a challenge to many. Men should be encouraged to take advantage of the Marine Corps Institute and the United States Armed Forces Institutes. Subjects are available that will not only aid them in the

service but also when later they return to civilian life.

Probably one of the greatest morale factors on an isolated island is the beer issue. It is not only important that the men receive their beer but it is just as important that it be issued cold and as regular as the supply will permit. A beer garden or "slop chute" should be made available. This should be a place that will induce the men to "drink it here" rather than in their tents. The cola issue is as important as the beer issue as the number of non-beer drinkers in the service is very large.

THE training program, while not as important as certain phases of training in wartime, should be given careful thought and planning and closely supervised during its execution. Granted there is no dead-line or readiness date to prepare the unit for combat, but a certain amount of training must be accomplished to keep the efficiency of the unit up. The mission of the unit will be the guiding factor of the training program. The same principles of a good training program that apply in wartime should be carried out in peacetime. The number of training hours will in most cases be reduced, but while the men are training, they should feel that they are receiving the maximum benefit of the time allotted. Training aids should be used to the greatest extent possible.

Parades, formal guard mounts, and other ceremonies should be held as often as practicable. Personal appearance and smartness should be stressed so that all men will take pride in themselves. Military discipline and courtesy should be stressed as it is very easy for a command to fall into sloppy and unmilitary ways on an island that is separated from civilization by many miles. A certain amount of informality must be permitted that would not be possible on more populated and larger posts but there must be no encouragement for the men to go "native" just because they are on a small atoll.

It is important that as much of the monotony that is always present to bother the lonesome overseas detachments be removed. This can be done in many ways some of which have been elaborated above. The use of these are suggested and other high morale producers depend only on the experience, ingenuity, energy, and imagination of the commanding officer and his subordinates.

Cover Reprint Supply Exhausted

We regret to inform our readers that our present supply of cover reprints, which depict some of the highlights of Marine Corps history, has been exhausted. When these covers are available again, advance notice will be given in the GAZETTE.

Dieppe and Tarawa

The doctrine of the British was surprise, whereas we called for a coordinated and planned preparation by naval gunfire and aerial bombardment before landing the first wave of assault troops. By Bill Lowe

THE military historian of the future seeking to understand the development of modern amphibious tactics can best begin his study with a comparison of the British combined operations raid against Dieppe in the summer of 1942 and the attack launched by elements of the Fleet Marine Force against Tarawa in the autumn of 1943.

Those brief, costly, but very necessary assaults reveal the two major trends in the evolution of landing operations doctrine in the 20-year period between World Wars I and II and will show why one was adopted over the other. From such combat trials came the basic pattern for later operations that established Allied armies ashore in North Africa, Italy, and France and gained the Pacific bases from which Japan finally was defeated.

DIEPPE

On 19 August 1942, a combined force of almost 15,000 Canadians, British, Fighting French, and Americans landed under British command at six beaches in the vicinity of Dieppe on the German-held Channel coast of France. The Royal Navy and Air Force and the U. S. Army Air Force supported the operation. It was the first vigorously opposed Allied landing of the war and the most extensive reconnaissance in force of the entire six-year conflict.

The two chief purposes of the Dieppe raid were to test German defensive strength and tactics on a strategically important shoreline and to gain experience in combined operations techniques for large forces, which Prime Minister Churchill called "an indispensable preliminary to full-scale operations."

COMBINATION of aims to apply maximum effective force against an enemy at the right place and time had been developed by ground forces in the 18th Century with the organization of varied units into one striking force. The flexible power of coordination increased with the invention of new weapons, such as the tank and airplane, and improved communications. German blitzkrieg tactics and Allied air-tank-infantry teamwork in World War II demonstrated the effect of purely military coordination in its most modern application. Integration in naval tactics also had evolved and saw its ultimate refinement in the organization and employment of the U. S. Pacific Fleet's fast carrier task forces. The all-inclusive combination of military and naval forces, which dates to the early time man first crossed water to wage war, reached its ascendancy in 1944—after Dieppe and Tarawa.

The Dieppe raid was planned under the direction of Vice Admiral Lord Louis Mountbatten's combined operations headquarters. This staff had previously directed the smaller destructive commando raids against Vaagso and Lofoten in Norway and St. Nazaire and Boulogne in France, but had never undertaken a mission of comparable magnitude. The landing force included two British Army commando units, a Royal Marine commando unit, the 2d Canadian Division, and members of U. S. Army Ranger and Fighting French detachments attached to British and Canadian units as observers.

THE operation was mounted in the United Kingdom, where a large flotilla of landing craft was assembled and dispatched for the 64-mile shore-to-shore movement across the English Channel. The convoy was escorted by destroyers and protected by the greatest umbrella of Allied air cover yet employed.

The attack was conducted in two phases. Commando units and elements of two Canadian regiments landed at 0450 without gunfire or air support at four points on the flanks of the main Dieppe beach in order to destroy two coastal defense batteries (of 12 six-inch howitzers each) and to support the main effort. Only one unit gained the surprise it sought, destroyed the battery assigned to it, and quickly reembarked.

A heavily armed enemy coastal convoy intercepted the approach of the commando unit on the opposite flank and destroyed all but one of its landing craft. The 20 men in the surviving boat, all headquarters personnel, landed and managed to neutralize the German battery with the fire of two pistols, 11 rifles, six submachine guns, and one 2-inch mortar within four critical hours. Both Canadian units in the preliminary landing met stiff resistance from the beach and ashore; one was held off the beach for 20 minutes by the same German convoy until British destroyers intervened.

The main landing at Dieppe was preceded by limited destroyer and mortar gun boat bombardment and covered by smoke screen. Tanks with accompanying engineers and infantry formed the assault waves and were boated in tank landing craft. Poorly suited to the task of fighting through the town's narrow streets, which were lined with reinforced and heavily fortified houses, the tanks suffered heavy losses.

After nine hours of battle, the landing force withdrew and reembarked in the surviving landing craft.

Virtually all tanks landed were abandoned. Other losses for the operation included one destroyer sunk during the evacuation, many landing craft, and approximately 50 per cent casualties for the landing force. On the other side of the ledger, results were: some prisoners taken, enemy forces and installations destroyed, and valuable intelligence of enemy coast defenses.

Air operations during the raid, although related, constituted a separate battle. There were some preliminary machine gun and cannon strafing attacks against beach defenses and known installations in the area, but they were not of a sustained nature. Aerial activity, however, consisted chiefly of a great melee between British and German fighters, which raged overhead throughout the landing. The RAF succeeded in flushing the long-hidden Luftwaffe strength in western Europe, in keeping off the back of the landing force, and in destroying 275 planes with a loss of 98 of their own.

There was a widespread belief prior to World War II that the effect of modern defensive weapons was too great to permit assault from the sea. This idea gained impetus after the Gallipoli fiasco of 1915. At Dieppe, it was easy to see the apparent logic of the belief. However, two groups, one British, the other American, had studied the errors of Gallipoli and had reached the conclusion that amphibious assaults were feasible. Both realized that offensive tactics improved as fire-power and mobility were increased, that weapons which had

made defensive warfare so formidable could be utilized with comparable effect in the attack, and that in the final analysis it was organization and methods of employment, not weapons which provided the solution. Both agreed that whatever the tactics, they must be vigorously applied. The doctrine developed in England and championed by the commandos was tried at Dieppe.

Admiral of the Fleet Lord Keyes, chief of combined operations before Mountbatten and chief of staff to the naval commander at Gallipoli during World War I, states the first axiom of British tactics as follows: "Among the most valuable lessons we learned (at Gallipoli) . . . was the folly of attempting to storm a defended beach in daylight. All our amphibious operations after this had a regard to the vital importance of surprise."

The success of early commando raids had tended to substantiate the British faith in surprise as the key to amphibious success. At Dieppe, success depended on surprise in the preliminary flank attacks; no other contingency was provided for. The neutralization of one battery was the result of heroism, upon which a shrewd commander cannot afford to rely. Acceptance of the surprise premise implies that naval gunfire is of limited value only in support of landing operations. Effective shore bombardment requires time for execution prior to the landing and daylight for control. It is, therefore, largely incompatible with surprise.

Discarding fire support, British planning, organi-

Thorough planning, not surprise, was the element of the marines' victory at Tarawa.



zation, and training emphasized the precise execution of separate assigned tasks by small units in accordance with a rigid timetable. Variation from a plan once placed in execution was not possible. The entire mission depended on the accomplishment of each component task. Each unit was briefed to do one job only. This inflexibility is further remarkable when it is based on unwavering faith in intelligence and assumed weather and hydrographic conditions. Another notable characteristic of commando operations was the small size of the forces provided to carry out the most ambitious undertakings. It is undeniable that a boy was sent to Dieppe on a man's errand.

A final feature of British tactics was the loose coordination of sea, air, and ground operations. Each service performed its own distinct mission; the three were neither closely combined nor mutually supporting in any direct way. The landing and fighting ashore were considered almost exclusively the province of the ground forces.

TARAWA

Embarked on what the late Navy Secretary Knox called "a new campaign against Japan from the Central Pacific on a much more direct route," the 2d Marine Division, Reinforced, landed 21 November 1943 on Tarawa in the British-mandated Gilbert Islands which had been held by the Japanese since 1941. The purpose of the attack was the recapture of the island and its development as an advanced naval and air base.

The atoll was located strategically athwart the equator northwest of Allied bases in the Ellice Islands and south and southeast of important Japanese bases in the Marshalls and Carolines. It was a necessary step in piercing the enemy perimeter and projecting U. S. sea and air control westward through the mandates to the Empire. Tarawa, Kwajalein, Eniwetok, Saipan, Iwo Jima, and Okinawa were the logical stopovers on the direct route to Tokyo Bay. Like Dieppe, Tarawa was a test of command, organization, and tactics.

Planning was begun in August at Pacific Fleet headquarters at Pearl Harbor by the amphibious high command. Intelligence estimates based on aerial and submarine reconnaissance and reports by former British residents indicated that approximately 3,000 enemy were strongly entrenched in pillboxes and blockhouses throughout the small island, especially at the shoreline.

IN the first attack against a defended atoll the reef problem appeared for the first time, and means had to be devised for traversing it. Intelligence, especially in regard to meteorological and hydrographical condition, had to be complete and disseminated to all echelons at an early date. Planning and training had to be at once detailed and flexible. A preparatory air and surface bombardment had to be conducted to pave the way for the

landing. Similar strikes had to be delivered against other enemy positions in the area to conceal specific intent. The landing force had to be transported and protected on its long movement to the objective. Supporting fires and adequate reserves had to be provided to support and exploit the landing.

THE forces made available to the arawa attack force included, three OBBs, three CAs, three CLs, 23 DDs, two DEs, two AMs, five CVEs (each carrying 16 fighters and 13 torpedo bombers; other aircraft were available for support from covering CVs) in the fire and air support groups; and 12 APAs, five AKAs, three APs, one LSD, 12 LSTs, five LCTs in the transport, garrison, and LST groups. The landing force consisted of the 2d Marine Division (Reinforced) less the 6th Regimental combat team—held in Corps reserve afloat until released to the division on D day plus one—and was commanded by MajGen J. C. Smith.

The objective had been bombarded twice since the Japanese occupation by surface units of the U. S. Pacific Fleet, and for a week prior to D day, both land and carrier-based air attacks struck the atoll almost daily. Naval gun bombardment by heavy surface units began before dawn on D day and was the heaviest ever delivered up to that time.

Assault battalion landing teams of 488 men each were boarded in the 125 amphibian tractors provided to move the first three waves across the coral reef and lagoon to the beach. The LVTs moved slowly from the transport area to the line of departure. It was a longer trip because the transport group was out of position and they failed to meet the scheduled H-Hour. Scheduled gunfire was repeated but air strikes were postponed to meet the revised landing time, and the enemy was up and waiting for the attack. The LVTs were unarmored and their low speed made them vulnerable even to small-arms fire.

Later waves, embarked in standard landing craft (LCVP, LCM, etc.), hung up on the reef and troops attempted to wade through withering fire in waist-deep water 500 yards into the beach. Casualties were heavy. Some amphibian tractors returned to the reef to transfer troops from the boats but, as a result of resistance, disorganization in the ship-to-shore movement was considerable. Only 20 LVTs were operative on the afternoon of D day; 90 were put out of operation in the entire operation. The 2,500 tons of naval gun bombardment had obviously not been heavy enough, nor accurate enough.

The island fell, as the *New York Times* reported, "because every man who fell had a shot at the Japanese before he went down, and more Marines kept coming and coming as those in front of them died, until finally so many Japanese were dead, too, that the Marines were able to get on the beach." But "so many Japanese were dead, too . . ." finally because gunfire and air strikes were delivered as close as 50 yards in front of friendly troops.

Reserve battalions were committed on D day, and on D plus one, the 6th Regiment was released by Corps and landed. Adjacent Bareiki Island was occupied and field artillery went into position there to join the naval guns and planes in supporting the landing force. Ship-to-shore control was finally reestablished with the aid of a logistical control vessel offshore.

A precedent was set at Tarawa for the creation of a false beach offshore where supplies and troops from the transport area could be screened by landing force and naval attack force representatives familiar with tactical requirements before being dispatched to the beach. This became standard for opposed landings. Tarawa fell on the afternoon of November 24th. The 2d Marine Division lost over 985 killed and 2,500 wounded in action, but had conducted its most skillful amphibious operation.

THIE first lesson taught at Tarawa was that U. S. Marine Corps landing operation doctrine was sound. The high cost was not the result of faulty organization, command failure, or tactical inadequacy; it was exacted by the bitterest opposition encountered in the Pacific war. However, certain deficiencies in the application of tactics, which had escaped notice in earlier unopposed landings, were brought into sharp focus for the first time.

The deficiencies were quantitative, not qualitative. The technique of coordinated shore bombardment by naval guns and carrier air was essential, but more of it was needed—especially in the preparation. An extensive, protracted, slow, deliberate, close-range bombardment utilizing armor-piercing as well as high capacity projectiles was required to destroy heavily reinforced defenses of the Tarawa variety. Improved control and coordination in logistical, and, in fact, all other phases, would result from constant, realistic training, discipline, and experience. Old weapons could be improved (the LVT needed armor, a rear ramp, and speed) and new ones were needed (napalm-gasoline bombs would help reduce blockhouses and DUKWs would be a good supplement to amtracs).

Tarawa showed that the Marine Corps did not blame the failures at Gallipoli or the difficulties of Dieppe on lack of surprise. American tactics, already well supported by the British experience at Dieppe and put to the test in the Gilberts, took as their premise the need for concentrated fire-power in preliminary bombardment and in close support of a highly coordinated landing assault.

Flexibility in planning was likewise essential, and alternate schemes of maneuver were standard. Military-naval cooperation under unified command was the order in execution as well as in planning. There was more than a joint planning headquarters; there was one integrated plan for all participating services, and its execution was carefully controlled and coordinated.

Naval, air, and land superiority at the objective,

achieved not in numbers alone, but in organization, equipment and tactics—in a concentration of combined force, was considered the prerequisite to amphibious attacks. Had the Royal Navy held command of the sea at Dieppe, German E-boats would never have intercepted British landing craft. Although air supremacy was being decided over the beaches during the Dieppe landing, no close air support was available. The defenders of Dieppe never relinquished ground supremacy.

Tarawa would not have been won, if the U. S. Pacific Fleet had not exercised its superiority to isolate the atoll, deliver a preliminary bombardment against it, and support the landing with every gun and plane available. If the British had used fleet guns to destroy the enemy batteries on the flanks, neutralize installations in the rear, and damage beach defenses at Dieppe, casualties would undoubtedly have been less. The lack of support gained them nothing and cost them much.

The Marines recognized, of course, the need for good communications and a technique for centralized control of air support, naval gunfire, field artillery, and mobile armor. They depended as little on stratagem as they did on surprise, and believed in a simple plan, worked out in complete detail, and vigorously executed, providing for an assault landing (whether or not landing was opposed).

With a base of fire from the sea and air, the landing force approached rapidly in landing craft or vehicles, deployed when within hostile small arms range, and assaulted the beach simultaneously on the broadest front commensurate with control and fire support capabilities. A considerable force was maintained in reserve afloat to support and exploit the initial assault, thus realizing the mobility inherent in seapower. To the Marine Corps, practice has always been as important as planning, and finally training has included full-scale, realistic dress rehearsals by all participants on terrain similar to that of the actual objective.

THIS, then, was the other trend in amphibious tactics developed between the World Wars, and it was chosen as standard for Allied landing operations in all theaters from Normandy to Iwo Jima. It must be remembered that there were important differences between Dieppe and Tarawa which required special techniques for solution. One was a raid involving a surprise attack and withdrawal; the other a sustained offensive. One was a shore-to-shore movement similar to those used for establishing later invasion beachheads on continental shorelines; the other, ship-to-shore movement for the capture of a limited land mass for use as an advanced base. One was a combined (nations), the other a joint (services) operation. However, both operations involved the coordinated employment of military and naval forces—surface and air—dispatched by sea for assault landings on hostile shores. Both needed sound basic amphibious tactics. END

Rubber Boats

Not only did they save friends; they helped destroy the enemy.

By LtCol Maynard M. Nohrden

THE rubber boat has probably destroyed as many enemy as it has saved friends. Such a double-edged weapon can scarcely be found in any other piece of equipment of the armed forces, unless it is in the amphibian tractors (LVTs) or Dumbos (PBVs).

Like the amphibian tractor, this craft was conceived of Mercy rather than Mars, having been designed as a lifesaver for use under special conditions. One of the first jobs accomplished by this collapsible boat was as a standard piece of equipment in many of the larger naval seaplanes in the "30s." This little yellow bundle of insurance became a very conspicuous passenger aboard many of the "big boats," and indeed it is to this rather odd blob of fabric that many a flier today owes his very existence and continued ability to fly.

The rubber raft was originally a very unpredictable, vulnerable and temperamental item. In its early form, the development of the rubberized fabric for the hull left much to be desired in respect to durability, strength and ruggedness; the reliability of the automatic carbon dioxide inflation system was subject to the vagaries of weather, trial and error, and that ever unknown factor, the "human equation." The lack of respect for this craft is indicated by such appellations as the "doughnut" as applied to the one-man variety and the "beauty-rest" in reference to the five or seven-man size. Having won several important innings in the game of rescue, however, critics withdrew some of their earlier skepticism and observers decided that with some grooming, development and training, the rubber boat had definite possibilities.

Designing engineers, research men and aviators were put on the job of development, experimenting and testing. Their inventiveness, ingenuity and practical efforts ran the gamut of the imagination in fitting out these little craft. The correct combination of rubber and fabric for the hull had to be arrived at. Flexibility, lightness and durability were required for easy packing, stowage and breaking out.

Engineers had to compromise between the necessary and the desired. The craft had to be capable of long periods of storage; it had to resist deterioration due to variations in climate; it had to possess

the quality of a "Minute Man." Such refinements as a sun awning, solar evaporator and a "complete" fishing kit were added. Such improvements as auxiliary hand air pumps, patching gear, sea anchors and bailing buckets were cleverly provided, in waterproof rubber envelopes equipped with a corrosion-resistant zipper opening.

In 1943, the Army Air Force conducted a series of "exposure" tests in these rubber rafts with volunteer crews as observation boats stood by in the vicinity to take data, readings and photographs of the experiments. Simulation of South Pacific conditions was effected and the data obtained were later used to great advantage in subsequent improvements on the rafts.

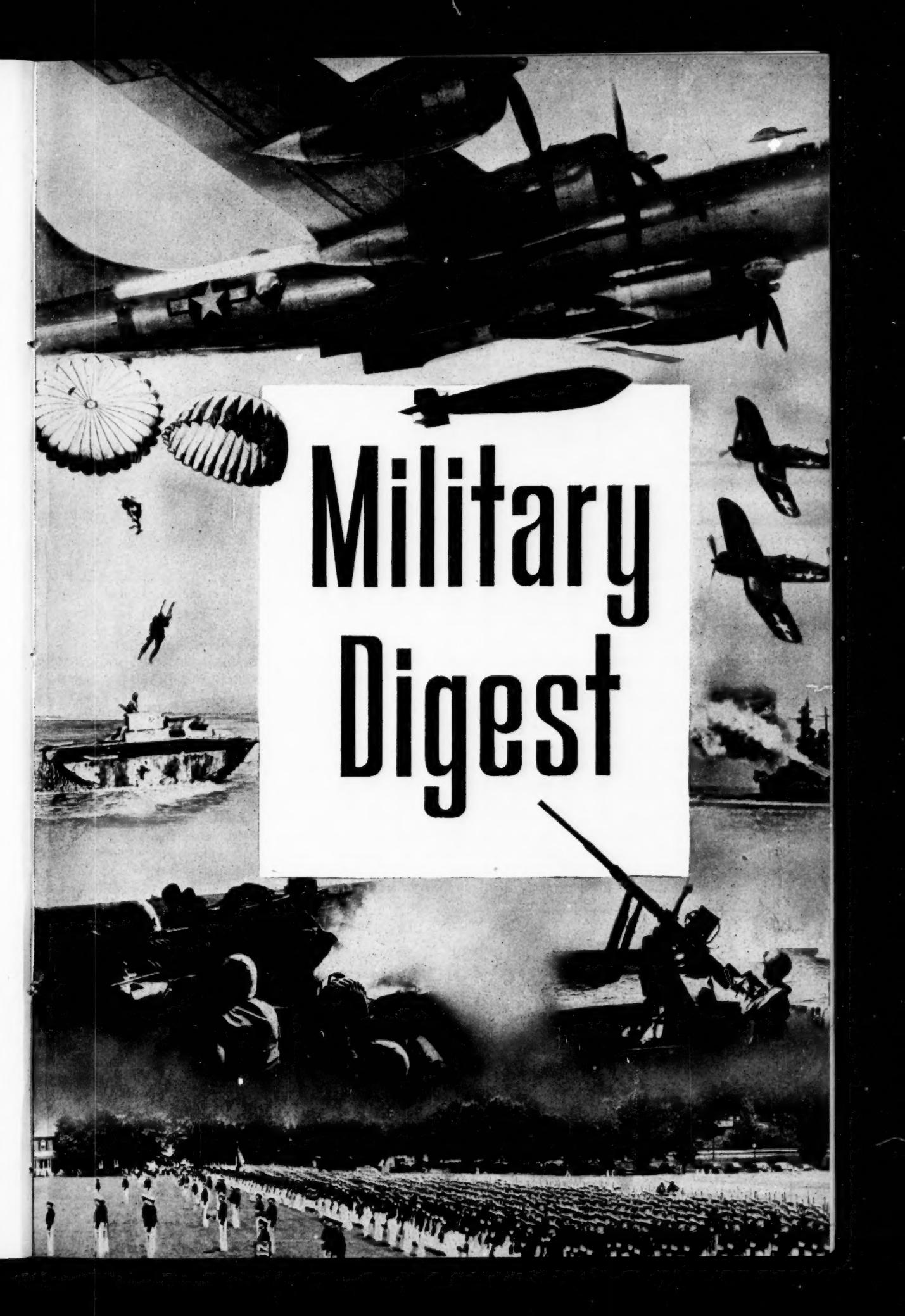
Quick to plumb the offensive possibilities of this craft was the U. S. Marine Corps in experiments and tests in 1938 when the tactical use of this boat was proved for combat work. A careful development program was launched to adapt this craft for use on intelligence missions, raids, and even with full-sized assault units which later became the Marine raider battalions. The boat was redoubled in strength and rigidity, compartmented for safety, enlarged to carry 10 fully equipped men, powered with silent outboard motors, and armed with a machine-gun mounted on a specially designed plate curved to fit the gunwale and similar to the transom plate which supported the motor.

Presto-like, this lifesaver had become a lifetaker —capable of negotiating rough water, shallow water, reefs and surf. It was difficult to detect due to its low silhouette and hence difficult to hit with small-arms fire. It was capable of landing on any section of a beach and equally capable of withdrawing therefrom.

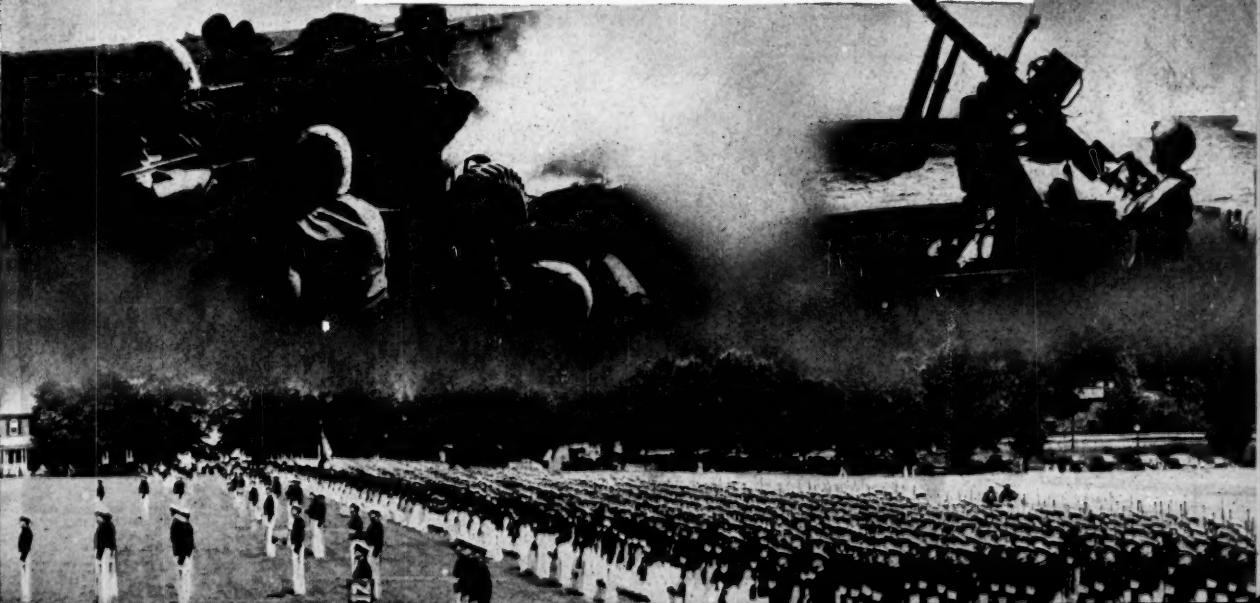
These craft were usually launched from submarines at night or from small assault surface craft just off a hostile shore. If an intelligence mission was assigned, the boat was usually silently paddled into the enemy beach, deflated, and hidden while the scouting and gathering of information was in progress during the daylight.

On an assault mission, where surprise was a key element, these craft were usually propelled by their motors to a point just outside the reef or breakers, from where the paddles were used for the final spurt. Machine guns and radios, well waterproofed, were in constant readiness for use either afloat or ashore, being rigged with special amphibious adapters for such bilateral use. The rubber raft had become a fighting craft and was designated the LCR or Landing Craft Rubber.

Love Charlie Roger was now a fighting boat in its own right and was adopted by all arms of the services of the United Nations. Ground forces used it for river crossings, air forces for lifesaving, service forces for emergency supply work and pontoon bridges, while the amphibious forces used it for assault on otherwise unapproachable islands. END



Military Digest



War Is Not All Weapons

by Comdr William J. Thompson

WHAT did the Japanese fight with besides a fatalistic determination inspired by an obscure creed? In the field of weapons, the Japs possessed and made excellent use of materiel comparable to United States ordnance. But wars are fought with more than weapons. Back of every thrust to exploit gains, to island hop, and to defend a strategic foothold were millions of man hours for construction, tons of materials and supplies, and innumerable pieces of machinery and mechanical equipment. Warfare of the type, speed, and scope of the Pacific operations required tractors, bulldozers, cranes, floating docks, barges with weight handling equipment, and a multitude of items to keep it moving. It was essential that construction keep pace with amphibious operations.

In the field of construction, machinery and its use, the Japanese, outside their home islands, were woefully weak. The failure to furnish materials, supplies and equipment was one of the most vital factors in the sudden collapse of the Japanese. It was apparent in late 1944 that they recognized this weakness for it was then that the Japs began varnishing it with propaganda by constantly referring to the Americans' reliance upon material superiority instead of native ingenuity and ability.

After the Super-Fortresses began their methodical destruction of Japan's cities, Radio Tokyo howled, "The warfare of today is the battle between material and material. It is a battle between scientific skills. It is a battle between machinery and machinery."

In one breath the militarist regime boasted that the bombings had only heightened the anger of the industrial soldier. Next came mutterings that were much nearer the truth—the story that industrial engineers and machinists were severely hampered

by lack of tools and iron. Stories were released explaining in boastful language the use of wood to supplement metal in the manufacture of essential war materials. The statements were partially true but the substitute did little to alleviate the shortages created by the aggressive action of our air and sea operations.

The scarcity in Japan of suitable construction material was a boon to the Allies. In the Japanese military machine were both Army and Navy construction troops, counterparts of the Seabees and the Army's engineer aviation battalions. Their construction equipment was meager, much of it was inferior to similar American equipment and they apparently did not possess personnel with sufficient skill to obtain the maximum efficiency from it. The Jap construction groups did not have the equipment to build sufficient installations to sustain its widespread army.

Equipped principally with crude hand tools and the simplest of mechanical equipment, the Japanese engineer troops were forced to rely upon a great deal of ingenuity to accomplish even minor missions. The troops usually had insufficient training and lacked the heavy equipment for earth moving and construction of the scope fostered by the material-conscious United States serviceman.

Where the Japs failed to take construction equipment with them, our Navy and Army hauled, dragged, wrestled and jockeyed all types of heavy construction equipment over the islands of the Pacific. The failure of the Japs to do the same in building outposts and bases undoubtedly made the task of reconquering the islands much easier. On the surface, the scarcity of proper equipment can be attributed to the instability of terrain and the difficulties of long distance supply and maintenance.

The air and sea blockade that bottled up and destroyed air and sea transportation was a contributing factor, but it should be remembered that the Jap had many months to build bases before the blockade became effective. Actually, the underlying cause is that Japanese industry had not kept pace with the United States in developing and using mechanical equipment. Labor had been plentiful and cheap. Before the war, time was not a factor on construction projects; hence they delayed in using labor saving devices.

During the New Guinea campaign some enemy equipment was found, the most noteworthy being a tractor with a hydraulically operated, detachable bulldozer blade. The unit also served as a prime mover. Welding was used extensively; so was aluminum. Track construction was similar to that

Gorgons and Gargoyles

The Navy has lifted the security on three new weapons. The "Glomb" is a pilotless glider which carries a 4,000-pound bomb. It is towed into action by a fighter plane and then released and guided toward its target by television. The jet-propelled "Gorgon" is guided to its target by radio or a target seeking device. It will carry a 10-pound bomb 550 miles per hour. The third, the "Gargoyle," is another jet-propelled target seeking missile which will carry a 1,000-pound bomb at 600 miles per hour. *Aviation News, Nov. '45.*



Although Jap equipment was inferior, Marines and Seabees could find use for it.

used in their combat tanks. At least this discovery revealed that they made and used some equipment resembling that used by our construction units.

The tankette, a small track laying vehicle, was used as a prime mover at several bases throughout the Pacific and the Far East. It has small compartments for weapons, personnel, and a small amount of supplies. In Burma, a truck was found with flanged wheels to operate on railroad tracks. This is neither novel nor new, and American troops employed jeeps in the same manner in their Far East operations.

Most Japanese radio equipment is considered as obsolete. Up to mid-year 1945, no use was known to be made of frequency modulation. The equipment, while used almost entirely in tropical and semi-tropical regions, was not properly protected against moisture or fungus growth. The principal of all Jap radio equipment appeared to be mobility.

The reader may have the idea that all Japanese equipment is obsolete or inferior. Far from it. Electric motors, appliances, and accessories compare favorably in design and construction with similar items manufactured in the United States. It is no secret that Japan has always had vast electric power installations. At the end of the war there were 1,200 power plants throughout the Japanese home islands. Japan can be considered as one of the most highly electrified nations in the world and that fact accounts for the high quality and expert fabrication of electrical machinery. For this reason, it is difficult to establish a reason why other me-

chanical developments have not kept on par with electrical progress.

Some first-hand information on Japanese construction equipment and hand tools were gained through the seven months of developing Iwo Jima into a gigantic air base. Iwo Jima had long been a Jap-held island. Motoyama Airfield No. 1 was started in 1933 and completed about one year later. It was enlarged in 1938 and prior to the incessant bombing during the softening up period it was a well designed and constructed airfield.

Because of its design and construction it was quickly repaired and placed in action by the assault troops. Inspection of the bomb craters showed that many hours of back breaking labor had been spent laying a layer of hand-hewn volcanic ash blocks beneath the surface of the runway. The same cut blocks faced the slopes of the embankment to prevent erosion. Today crushed stone and bituminous pavement surface the runways. This was done in a few weeks with American equipment by the industrious Seabees.

After the island was captured it was possible to inspect, and, in some cases, repair the equipment. In the engineer dump and disposal area and on the airfields were found smooth wheel tandem rollers, three-ton size, tractors, and bulldozers of 25 to 35 horsepower, scrapers or carryalls of three to four cubic yards capacity, small rock crushers, concrete mixers, a six-inch well drilling rig, and several trucks of about two-ton capacity.

Weight handling devices were nonexistent except

War Is Not All Weapons (Cont'd)

for one wrecking truck that would handle only light lifts. All of the rock crushers were of the coffee grinder variety but their number and locations enabled a fair output. When the Seabees moved in they established crushers with a capacity of 150 tons per hour and in one day produced more crushed stone than the entire Jap production for several days.

Tool steel found and used lacked uniformity of texture and chemical properties throughout. The carbon content would vary from high to low in the same piece of steel hence an inferior cutting tool resulted which gave a highly unpredictable performance.

Standardization of sizes and methods of assembly

added to the woes of the Jap mechanic. Several sizes of nuts and bolts were used in the same machine where possibly two sizes would have served the purpose. Because of this, the mechanic was required to have and use a variety of tools and thus waste man hours as well as operating hours.

One item widely used by Americans could not be found on Iwo. It was the electric welding machine with which the Seabees boasted they could repair anything but the crack of dawn and a broken heart. This cure-all has kept many a machine rolling that would have been deadlined for long useless days. The electric welding machine has earned its spot alongside the famed bulldozer and the jeep as the outstanding pieces of equipment that played a part in winning that war. *The Military Engineer*, Dec '45



How Good Were They?

by C. J. Hertel

I ARRIVED in Frankfurt, Germany on 4 May 1945 as a technical representative for Wright Field, to aid in the exploitation of the German aircraft industry. This European mission was created to find out how the Germans had maintained their high level of production, if they had developed new types of aircraft superior to our own, and to what extent German technical developments had been shared with the Japanese.

The purpose of the mission was accomplished through the surrender of drawings, documents and test reports and through verbal interrogations. We learned the most from the last source, namely gleaned the reasons behind the design of a specific item, which were frequently of more value than the possession of the completed article itself.

Our business was with the technical men of Germany who made possible a march against the world that was almost successful. These men were possessed with the scientific theories of their developments rather than the use to which they were to be put. Almost as great as their interest and absorption in their own creations was their interest in the scientific developments of the rest of the world. They spoke a language of abstracts and fundamentals and seemed not even to grasp political theorizing. Such Germans isolated themselves from their government with the well known disastrous results.

In London, from the files of the U. S. Strategic Air Force, the various technical representatives selected target folders (formerly used for bombing missions) appropriate to their specialized technical work, and from this original source the term "target" was used in designating any specific locality subject to investigation and exploitation of any technical data found there.

In the Leipzig area, both Messerschmitt (ME-109) fighter planes, and the Junkers (JU-388) were in mass production. Unlike our American plants where practically the entire airplane is fabricated and assembled in one continuous building, the production of these German craft was distributed over numerous smaller plants with the final assembly taking place at an airfield bordered by an assembly plant doing assembly work of only the major components.

At Raguhn were designs of a Junkers type 8-263, an improved version of the ME-163 having a tri-cycle landing gear, and double the range of the ME-163. We also found the JU-287, a high-speed turbine jet-propelled bomber. The wing beams of this plane were very similar to those of the Douglas A-25, employing massive spar caps due to the relatively thin section of the high speed wing. Approximately 10 drawings covering the major features of these two types of planes were obtained and forwarded to headquarters.

Between Leipzig and Gotha, at the city of Bitterfeld, the O. G. Farbenindustrie housed a 30,000-ton press, construction of which had begun in 1941 and was operating throughout the year 1944. This press had been used to manufacture propeller blades, and by the use of double impression dies its 30 strokes per minute produced 60 propeller blades per hour. Because of the large size of its platen, many airplane parts bigger than propeller blades were made by the pressing process, including a tapered spar cap 32 feet in length.

The almost total destruction we found in German war plants was due to three causes. As the American forces had moved closer and closer to a particular factory and occupation was inevitable,

the SS troops had instructed all employees in the plants to take their tools and personal effects, leave the premises and find a place of safety. Then the SS troops and the plant production men would go through and destroy everything of value. After all the Germans had evacuated the factory, the displaced persons, or slave laborers broke out of their miserable living quarters nearby and entered the plant bent on looting and destruction. This destruction took the form of breaking all the precision optical instruments in the test laboratory, wielding a sledge hammer against the instrument boards on the airplane production line, or the idle smashing of inkwells against the walls.

Next, the American foot soldiers arrived on the scene, and upon being delegated to the occupation and neutralization of the war plant, were billeted in the plant proper, taking up their residence in any convenient office or hallway of the damaged building that would afford protection from the elements. In the search of the building for hidden weapons, SS trooper trophies, and similar contraband, additional damage and displacement of records occurred.

In order to learn the answers to the three questions we sought from the German aircraft industry, we were forced almost entirely to find and question the men who had built up the industry. I interrogated Dr. Karl Berthold, general manager of the Gotha Wagon Fabrik where the ME-110 and ME-410 were produced. He was an out-and-out Nazi but through him I got the address of Dr. Rudolph Goethert, who developed the design of the flying wing known as the Gotha P-60. He was willing to discuss the plan freely but was unable to produce any drawings because he had buried them in his garden and American troops were billeted in his house. On the following morning the doctor produced the still damp drawings which he had dug up. I took Dr. Goethert to Paris as a prisoner of war and for further interrogation. He was quite happy to go as he was completely absorbed in the technical aspects of developing the design.

While in Paris I heard of the exploitation of the Messerschmitt target. Proceeding there, I found that three technical representatives had unearthed 42 steel containers of engineering documents at the Messerschmitt factories at Oberammergau. This set of drawings together with the availability of the German engineers proved the ideal condition for obtaining the information I needed.

Regarding the relative efficiency of the American aircraft industry and the German, a comparison is difficult because Germany had no manpower problem. When a plant needed 10,000 new workers, they merely imported that number of displaced persons, built a few crude wooden billets and their manpower problem was solved. For this reason I did not find in German industry the precision fabrication and interchangeable assembly methods as developed in the American aircraft industry. *Douglas Airview, Oct. '45.*

Amtanks Point the Way

by Maj John T. Collier

AMPHIBIOUS tanks were developed expressly for the purpose of leading assault waves ashore during landing operations in the Pacific. The original amtanks were armed with 37mm cannon; using gyrostabilizers, gunners could shell the beaches during their ship-to-shore phase of an assault. Such fire on the beaches was to prevent the enemy from remanning beach positions after the naval and air bombardment had lifted. On the beach the amtank could function to a limited extent as land tanks. However, necessarily light armor precluded their extensive employment on land tank missions.

The 776th Tank Battalion was issued new amtanks mounting 75mm howitzers. The battalion commander conceived a much wider employment of the newly equipped unit and determined to exploit to the utmost the capabilities of the 75mm howitzers in providing artillery support for the assault infantry. The account of the conversion and re-training of this entire battalion is a pertinent commentary on the rapidity with which it is possible to teach new techniques to well trained and disciplined troops.

For its first operation, the 776th Tank Battalion was attached to the 7th Infantry Division under the command of MajGen A. V. Arnold. The battalion commander presented Gen Arnold with his plan to train the 776th in field artillery methods and to provide artillery support for the division's assault regiments as soon as they needed it ashore. An artilleryman himself, Gen Arnold fully appreciated the value of having such fire support immediately available on landing. Considering this new idea as an important contribution to the technique of amphibious warfare he provided the instructions and facilities for training which made it possible.

The time for this training was short. It was begun in July 1944 and in September the battalion embarked for the invasion of Leyte. Moreover there was not then (and is not now) a single officer or man in the battalion who ever served in the field artillery. The T/O & E under which the battalion must operate were designed for a tank outfit and not for a field artillery unit. No fire direction or communications personnel are provided for and neither is necessary fire control equipment.

Although the battalion was reorganized along conventional field artillery lines, its nomenclature differs. The four gun batteries are platoons. Three

(Continued on next page)

Successor to the Sextant

"Loran," electronics' contribution to long range navigation, offers precise navigational coordinates covering a quarter of the earth's surface. Loran allows a ship or aircraft to determine its position within 15 miles accuracy while 1,500 miles from shore. Four pulse-transmitting stations are set up along the coastline to be navigated. Two of these stations, called "master" stations, are established at the same location with two "slave" stations located up and down the coastline. One of the master stations transmits a pulsating signal to a ship or plane. After a pre-determined delay, the corresponding "slave" station relays the same signal. The navigator aboard the ship or plane measures the time difference between the reception of the signals. By applying this difference to a Loran chart, he can draw a line on his map. His location is somewhere along this line. Repeating the procedure with altogether different pulsating signals from the other two stations, the navigator is able to draw another line. The intersection of the two lines marks the position of the craft. *Electronics*, Nov. '45.

Amtanks Point the Way (Cont'd)

of these platoons comprise a company, which is the equivalent of a battalion of 75mm artillery. There are four companies—a total of 48 guns—in the battalion. In each company headquarters are FDC and communications vehicles.

The landing on Leyte was made in accordance with a now familiar pattern. The amtanks constituted the first wave of LVTs, and covered the division front. Noteworthy in this connection is the technique of firing from the water developed by the battalion. Unlike the amtanks armed with 37mm guns, those armed with the howitzer are not equipped with gyro-stabilizers. Gunners were taught to fire on the upswing of the bow when the shoreline was observed between the zero and 400-yard line in the telescopic sight reticle. By this method accurate area fire was placed on the beach during the assault.

Ashore the amtanks reduced by direct fire the pillboxes and a few Jap positions before the infantry passed beyond them. Amtank units went into battery positions about 200 yards inland, and thenceforth fired only indirect fire as directed by forward observers. Amtank companies were in direct support of assault regiments until the division artillery came ashore; thereafter they reinforced artillery battalions.

After the 7th Division had moved across the mountains to the west coast of Leyte, elements of the 776th made a spectacular movement around the southern tip of the island by sea to continue in support of the division. This was by many times the longest movement by land or sea ever attempted by LVTs under their own power, and was made with no overland logistical support, in the face of doubt in some quarters that such a feat could be accomplished at all. The initial movement of 100 miles took the amtanks into enemy waters, and was

completed in three days. The unit was in the water continuously for about seven hours a day. Tactical operations immediately after the unit had reached its initial objective boosted the water mileage to 125, and some units accrued a total of more than 300 miles by the end of the operation.

As the 7th Division pushed up the coastal mountain range towards Ormoc, strong Japanese defenses on reverse slopes, well defiladed from our artillery fire, made the advance costly. It was in this situation that the amtanks undertook to bypass the Jap front lines by water, and shell his positions on the reverse slopes that were exposed to the beach. The first such strike was made at dawn on 5 December and achieved complete surprise. As they advanced by water up the coast, the amtanks shelled the Jap-held villages of Balogo and Tabgas.

Especially significant from the standpoint of the artilleryman was the operation against Palompon by an amphibious task force of the 77th division. This force staged at Ormoc on Christmas Eve for a movement across Ormoc Bay to seize Palompon, the last enemy escape port on Leyte. The entire artillery support of the operation was given by amphibian tanks. The 38-mile crossing was the longest movement across open sea ever made by amphibious vehicles.

The organization and techniques of the 776th have been recognized by higher headquarters and other amtank battalions have adopted them. Other units have sent members of their staffs to study the unit at first hand and although the T/O & E have not as yet been changed, the matter is receiving attention and study. The employment of amtanks as field artillery may be prophetic of future developments such as the production of self-propelled 105s to become the organic artillery of any units which may have to wage extensive amphibious warfare. *Field Artillery Journal*, Dec. '45. ★

Guarding the Ocean Airways

AIR-SEA rescue work began in earnest for the Navy's surface forces during the hazardous days of 1942, on the 2,000 mile Alameda-to-Honolulu run, when anything with wings was pressed into service. Ordinarily many of these planes would never have been used for the long flight. But this was an emergency, so they sputtered back and forth to Oahu. Some got tired and hit the ocean. To meet this problem, the Navy set up its first plane guard network. DDs, DEs and frigates were picketed along the run to guide planes by radio, to provide weather information and to stand by for immediate call on ditchings.

Today, four Coast Guard plane guard vessels, fully equipped for all emergencies, are all that are needed to guard this route. Many more ships are scattered across other Pacific routes. During the past year, special plane guards were picketed along the routes of individual carrier strikes against the enemy; and along army and navy bombing routes. Many networks were designed individually for each strike.

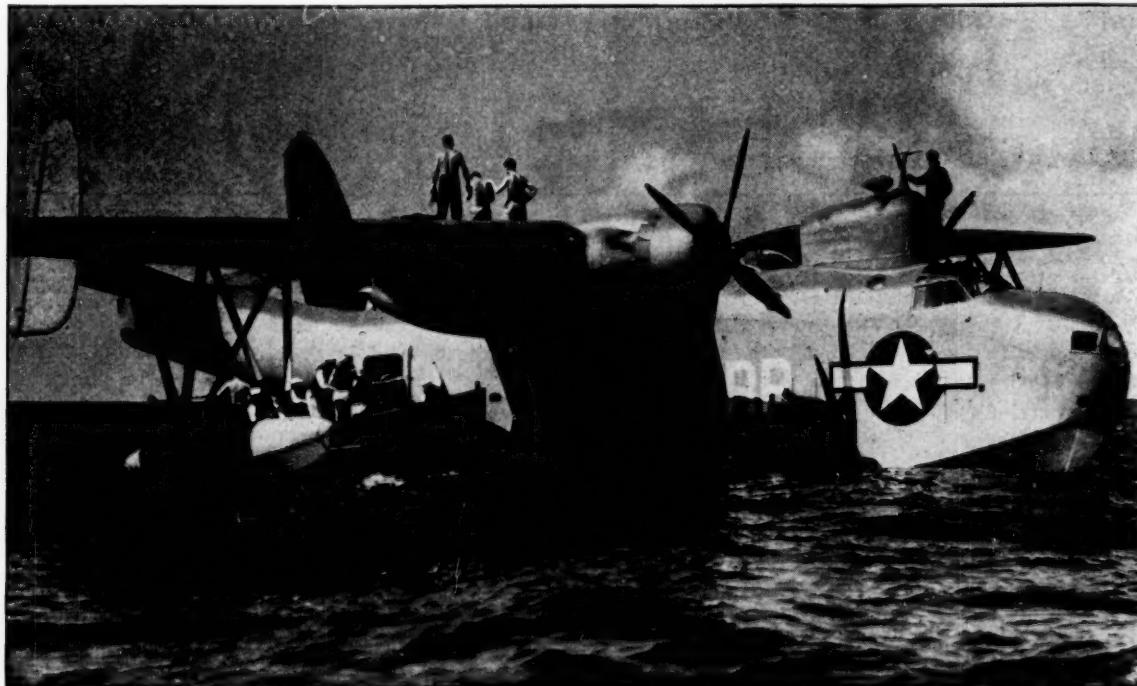
In the Atlantic, 22 ships of Task Force 24 stand at regular stations to guard planes laden with returning veterans from the ETO. Every 20 minutes since early last June, the 8th Air Force has flown a huge transport across the Atlantic, loaded with

returning veterans. Ditching has become a somewhat routine operation. Any fears the pilots originally had have been dispelled. Now each believes that he will be rescued. The largest mass ditching in history occurred on the night of 20 June 1944 during the long range carrier strikes in the Marianas operation. More than 100 aircraft were in the water over a huge area. Yet, more than 75 per cent of all crews were saved. Most rescues were accomplished by DDs and DEs, operating individually with no preconceived over-all plan.

Freedom to operate at the skipper's discretion has saved lives which might otherwise have been lost. A fighter pilot, shot down during the pre-landing strikes on Saipan, was rescued by the DD picket of another carrier group after he'd been adrift for 11 days. Another pilot was rescued similarly after four days at sea.

Great lengths to which some skippers will go to save lives is typified by the DD that steamed right into Tokyo harbor to pick up a ditched fighter pilot.

As the war in the Pacific drew to a close, fleet type submarines saw more and more duty in air-rescue operations. In the bomber strikes from Okinawa and the Marianas, lifeguard subs were picketed, along with DDs and DEs, all the way



The ability to land in mid-ocean gave the PBY a place in the air-sea rescue service.

Guarding the Ocean Airways (Cont'd)

up the routes of flight. At Truk, two or three subs were maintained constantly for rescue work. Because of their vulnerability to enemy action, life-guard subs are limited in freedom of movement. Of all personnel rescued from June 1944 to June 1945, the subs were responsible for 135.

One fighter pilot, downed within range of Guam shore fire during the Marianas battle of 20 June 1944, was towed out of danger by a lifeguard sub submerged to periscope level. He then boarded safely when far enough off shore. It was the first successful attempt at this ingenious type of rescue which eliminates danger from shore batteries. The advantage of subs in rescue work is clear. Their ability to creep in close to target areas, submerged and undetected, cannot be surpassed. Arrangements for their use in carrier strikes and long range bombing missions were well planned, not only to avoid enemy detection but also to prevent our own pilots from mistaking them for enemy.

All airmen are briefed on what to look for. Only U. S. fleet type submarines are used as lifeguard subs. They are easy to recognize by their clean decks, unique shape and the position of the conning tower, well forward of amidships.

Specially coded distress calls are used in signaling lifeguard subs, to avoid disclosing the sub's presence. Nor can the sub be used as a reference point. After sending his distress call the pilot must ditch, and sit tight until the sub comes to his rescue. Buddy planes may help the sub locate survivors by orbiting or dropping smoke flares.

Searching for a raft without help is rough duty for a sub, especially in swells or waves. Luck, however, has sometimes helped. One sub, alerted and vectored to a downed pilot near Amoni O'Shima, started toward the fix 20 miles away. A Jap Betty spotted the sub and forced it to crash dive. The skipper had to stay submerged until morning, and visualized a long painful search due to the raft's drift. At dawn he surfaced, almost upsetting the raft. They had drifted together.

When pilots are properly briefed the pickup operation is swift. A TBM over Ishigaki Shima was forced to ditch. The pilot called the nearby life-guard sub which surfaced immediately—ten miles away. The pilot saw it and ditched alongside, the three occupants crawled out, boarded the sub and were away in three and one-half minutes.

It isn't always that easy. Five crewmen of a PB4Y-2 escaped in a crash when their plane crashed only half a mile from enemy shore batteries. Despite this dangerous position a lifeguard sub, the USS Jalao, came in directed by a PB4Y-1. The Japs sighted the sub and opened up on it; however, the survivors were recovered. Two shells landed within 25 feet before the sub crash-dived and got away.

Some lifeguard sub skippers showed their own teeth. In one instance the sub was searching for the crew of a TBM, shot down a few hundred yards off the coast of Honshu, in full view of a Jap lighthouse and shore battery. The sub skipper ordered flares shot off, sighted the rubber boat, came alongside, took the survivors aboard—then deliberately shelled the Jap installations before departing. *Naval Aviation News, Dec. '45.* ★

Bullet in a Haystack

by Maj Bernard W. Crandell

WHEN massed formations of U. S. bombers were cracking open the roof of Europe, 1943-45, aerial gunners became good gunners only by combat experience and the grace of Father Time, the period of grace extending only if they caught on to the gunnery game without being shot down. Our aerial gunners were having to learn to shoot the hard way.

Previous to their first mission they had never fired a bullet under conditions simulating combat; and the situation was not to be rectified by firing thousands of more rounds at towed sleeve targets. Methods had been devised for training pilots, bombardiers, navigators, but gunners. . . .

The obvious solution was actually to shoot at our own fighters. The German Luftwaffe met this problem by a simple expedient—letting its bomber

gunners shoot aluminum bullets at its own fighters. Aluminum bullets sounded fairly soft to the German experts who developed the scheme, but it was frequently fatal to the fighter pilots who, after all, were considered expendable in view of the vital training they were contributing.

No one in the U. S. Army Air Forces had even dreamed of following the grisly pattern of the Luftwaffe. No officer in his right mind would have risked the embarrassment of going on record as being in favor of aluminum bullets or any other kind of screwball bullets. No one, that is, except Capt Cameron Fairchild, who in civil life had been an architect. He announced that he could find a bullet that could be fired point-blank against a friendly fighter. The bullet would not kill, it would break into a thousand pieces on coming in contact

with a fighter plane which would be covered with armor.

Finding the answer to the gunner's prayer was like finding a bullet in a haystack. It took Fairchild two and one-half years to dig through the haystack.

Correspondence with the engineering schools of 120 colleges and universities brought only two responses offering any encouragement. The rest believed that Fairchild's proposal to find a bullet with good ballistics that would disintegrate harmlessly on the target was a good idea, but highly impractical. Dr. A. D. Moore of the University of Michigan suggested using a bullet of tempered glass having the characteristics of a "Prince Rupert's Drop," which disintegrates into a fine powder when the sensitive tip is broken. And from Duke University came an offer to turn over the full facilities of its research laboratories, including the services of Dr. Paul Gross, director of research.

Experiments by the Corning Glass Company proved that the idea of a glass bullet was feasible but that production costs would be prohibitive. The thought rankled in Fairchild that the Nazis had used an ersatz bullet, the Italians had resorted to a wood projectile, and the French, seeking the deadliest type missile, had produced a splintering glass bullet for ground rifle fire. The ingenious Yanks had only an idea.

Despite continued opposition Fairchild made progress with the help of scientists at Duke and Princeton Universities and the Bakelite Corporation research laboratories. It was here the frangible bullet was born—a mixture of lead powder with a plastic binding that acted like the real McCoy until it hit a piece of armor plate. It then broke into a puff of powder leaving only a smudge to show where it had struck.

Adaptation of the frangible bullet to training was still months away. No one except Fairchild and his scientists had seen the bullet and as yet no armor plate had been found that could be slapped on a fighter plane without making it lose flying characteristics. A girl scientist, Katherine Jeffers of Duke University, helped solve the armor problem. She stayed on the Duke test range until she found the plate that met all the requirements. It was duraluminum, a common aluminum alloy.

In May 1944, the bullet met with its first prolonged firing tests against an airplane. The plane was an A-20 clad with a layer of specially treated 3/8 inch dural and was named the "Alclad Nag."

Capt Charles E. Everett had a distinguished combat record and when he was ordered to participate in firing tests of a new ammunition it did not sound like an interesting assignment.

"You're not doing this to me," he protested. "When I was sent here they told me I was going to do the shooting, they didn't tell me I was going to be shot at."

Mine Detector's Future

Voids or discontinuities in plastic objects could be located by a peacetime adaptation of the non-metallic mine detector. It might also be valuable in plant protection or machine safety installations, since it can, when adjusted off resonance, detect personnel or vehicles in motion up to a distance of 100 feet. It will, of course, detect non-metallic objects at shallow depths in the ground, and could be adjusted to detect metallic objects of finite dimensions in non-metallic objects. *Electronics, Nov. '45.*

Fairchild led him to the flight line where the "Alclad Nag" drooped pathetically in her armor overcoat. Fairchild handed him a rifle and said. "Shoot at it." Capt Everett eyed the plane suspiciously and then whanged away at the most vulnerable spots. This test convinced him and he was ready to fly.

At 5,000 feet Capt Everett made a beam attack on a B-17. The gunner was excited at first but on the second pass he began to score hits. In the nose of the "nag" was a powerful lamp that flashed each time a bullet found its mark and inside the cockpit there was a computer that rang up the number of hits like an automatic cash register.

Now that the ammunition had been proved it was necessary to select a suitable fighter plane for the actual training. The "Kingcobra," P-63, was finally selected and the Bell Aircraft engineers went to work equipping two of them with bulletproof petticoats. With the addition of the hit recorder and the lamp in their noses, the planes were ready for action. The first one was named "Pinball."

When the first two planes arrived at the central school for flexible gunnery they aroused a good deal of speculation as to their mission but they managed to withstand the curiosity. A selected group of gunners from three schools begin flying missions against "Pinball" and "Frangible Sal." Black smudges began appearing on the bright orange paint jobs of the two P-63's. A group of newspapermen, taken up on one of the missions, testified as to the realism of the practice, with only a machine gun sight to separate them from the oncoming plane.

The frangible bullets payed off when the gunners got to the battle zones and the practice was considered as the best sport to be had at the training fields—that is, sport for everyone except the target pilots. Capt Everett complained, "This is the most one-sided war I've ever seen. When do I get a chance to shoot back?" *U. S. Air Services, Dec. '45.*



Tactical Air Power

The lessons learned in Africa, applied to the war on the continent, helped hamstring Germany's vaunted war machine and integrated the functions of aircraft in high speed warfare. *(Last of two articles)*

"**W**HETHER the enemy can be stopped at this point is still questionable. His air superiority is terrific and smothers almost all our movements. At the same time, every movement of his is prepared and protected by his air force. Our losses in men and equipment are extraordinary. The morale of our troops has suffered heavily under murderous enemy fire, especially since our infantry units now consist only of haphazard groups. Behind the front, terrorists, feeling the end approaching, grow steadily bolder. The Eighty-fourth Corps has reached a certain degree of disintegration . . . fresh troops must be brought in . . . from somewhere."

This was the dismal report Von Kluge, commanding the German armies in northern France, sent back to Hitler two weeks after the First American Army had broken out of the Normandy beachhead at St. Lo.

Our tactical air forces had held the German air force to only a puny effort, considering the cosmic nature of our attack. The Luftwaffe was nowhere to be seen, having failed utterly in its greatest crisis. Without it, the mighty Wehrmacht was being dissected by an enemy ground force no greater than itself, with considerably less battle experience, but

made irresistible by the addition of American tactical air power.

This scarcely resembled the situation of a scant four and a half years earlier. The Germans had started the struggle with practically all the advantages. Their political, economic and sociological structure had been carefully shaped for war for a number of years. They had the best equipped and most efficient (if not the largest) army, by far the largest and most powerful air force in the world. They were surrounded by smaller, weaker, poorly prepared neighbors. Of the great powers which might possibly constitute a threat to them, one, Russia, was an enigma whose military ability and industrial efficiency was open to question; Britain had no army or air force worthy of mention; the third, the United States, was thousands of miles away and woefully unprepared.

Germany was smaller than some of her potential enemies, but she depended on her speed of conquest to enlarge both her manpower and resources to a point where she could safely ignore this handicap. Moreover, she leaned heavily on what she thought was her superior air force. She was unaware of two British items, the new Spitfire, and,

more important, radar. The Spit, heavily armed and swift, designed exclusively for the destruction of other planes in the air, was made enormously efficient by radar. Against German aircraft that had insufficient armor and armament, the result was massacre. German failure against the Spitfire-radar combination may well have cost Germany the war. It certainly for a long time ended her offensive ability in the west.

Another disadvantage of Germany was her concept of how the war would be fought, and was, in essence, an insufficiency in the realm of ideas. Her air force was, up until the end of the war, purely tactical. Her air planners did not discern the huge dividends that can accrue from a carefully planned strategic bomber offensive against the key industries that support ground armies.

It will be a long time before evaluation boards and the other experts have made their final reports on what was accomplished by American air power in this war, but there is no man who can say the American air forces did not superbly fulfill the three missions of tactical air power as defined in FM 100-20: (1) Gain the necessary degree of air superiority. (2) Prevent the movement of hostile troops and supplies into the theater of operations or within the theater. (3) Participate in a combined effort of the air and ground forces, in the battle area, to gain objectives on the immediate front of the ground forces.

Wherever the ground forces went after the Normandy landing, they discovered the air forces had usually been there before them. Great areas of the cities the doughfoots assaulted had been battered to the ground long before by the strategic bombers. Whenever the weather permitted, tactical bombers softened up German strongpoints. In another way, too, the airmen kept the armies rolling. Fleets of transports brought millions of tons of supplies to the fronts. It all represented the greatest coordination of air and ground assault ever seen.

As the battle moved closer and closer to the core of the German fortress, all heavy bombers shifted from strategic bombing to support of ground troops for the final phase. The Luftwaffe was immobilized;

Pattern for the Future

EDITOR'S NOTE: This is a digest of a descriptive analysis of the technique, development and effect of tactical bombing against Germany as presented in IMPACT, magazine of the Army Air Forces, and by the U. S. Strategic Bombing Survey Report. The GAZETTE offers a condensation of this article because IMPACT and the U. S. Strategic Bombing Survey Committee have accomplished a competent and authoritative resume of one of the determining weapons in the reduction of Nazi Germany; and because neither in part nor in whole has any estimate of the over-all effect of the employment of aircraft in the European war been widely available to marines.

only a few planes dared to come up and tangle with the Allied fleets. Our troops crashed to the Rhine beneath a canopy of air superiority.

It was not until the African campaign our present doctrine on the employment of tactical air power was forged wherein a single commander with equal subordinate commanders of air and ground worked together at a combined air-ground headquarters. Such an arrangement guaranteed joint planning, efficiency and flexibility. The African experience taught that air units, instead of being "frozen" to various ground organizations, could be utilized for strong punches where most needed and that air forces could be split into separate tactical or strategic air forces with the latter available for tactical tasks when needed.

The Germans kept their tactical air units shackled under the command of ground generals and in numerous other ways did not measure up to us. One outstanding example is the tremendous potency we have derived from fighters by hanging bombs on them. Early in the war, the Germans used their fighters solely for escort.



The Germans attempted to delay our advance by dropping this Rhine span at Coblenz.



These Germans fled from their anti-boat defense as a P-38 strafed the beachhead.

In June 1942, the situation of the Allies was little short of desperate. America had been in the war for six months and had seen her bases in the far Pacific overrun, her puny overseas air strength literally engulfed. In Africa the Germans were attempting to split the Russians and English by capturing Egypt and the Suez Canal. It was decided to reinforce Allied strength in Egypt. The newly activated U. S. Army Middle East Air Force, with a single squadron of B-17s, proceeded to Cairo. The 9th Air Force was born and America's organized participation in the European tactical air war had begun.

A better proving ground for a tactical air force than North Africa could not have been found. It had all the elements, on a small scale, of the greater battles we would have to fight later. We could profit cheaply by our own mistakes and by the example of the British, who already had two years' experience under their belts.

The mission of the 9th Air Force in Africa was simple: Eliminate the enemy air force, and at the same time work with the British Eighth Army. By 23 October, when the Battle of El Alamein started, the American air unit, the 9th Air Force, had grown to 164 aircraft. The British had 1,117. Opposed to them were about 1,000 German and 1,000 Italian planes of all combat types. Allied air power struck at the enemy supply lines, smashing warehouses, sinking convoys and clogging ports with the hulks of enemy supply ships. The enemy's supply lines became further and further strained.

At the same time, medium bombers plastered the

German airfields with fragmentation bombs and the fighters took their steady toll in the air. By January 1943, Rommel had lost 700 planes. Many of the planes captured intact by ground forces were unable to escape because their tanks were dry. The value of the plane as an interdictor of battlefields was becoming apparent.

Another American air force, the 12th, moved into Africa, hastening the collapse of the Axis there. The Germans were not able to match that growth or to replace their aircraft losses as they would have liked because the battle for the elimination of the Luftwaffe had spread as American and British fliers in England set their sights on aircraft production and other strategic facilities in western Europe.

To combat this menace, Germany was forced to shave her aircraft requirements for Africa and for her assault on Stalingrad, and to commit an ever greater number of planes to the defense of her home industries. This trend continued for over two years and was not reversed until the Russian advance in the early months of 1945 had almost reached the gates of Berlin.

Suddenly impressed by the effectiveness of strategic bombing, Germany also overhauled her aircraft manufacturing schedule, embarking on a concentrated program of single-engine fighter production. But it did not come soon enough.

As the campaign in Africa drew to a close in the spring of 1943, plans for an invasion of Europe from the west were beginning to take shape. The headquarters of the 9th Air Force was sent to Eng-

land and began the enormous task of building a tactical air force to participate in the invasion. This would eventually consist of a bomber command (the 9th) and three tactical air commands (the 9th, 19th and 29th) to work with the three American armies being gathered for the offensive.

It was a year of feverish preparation, a year of practice, practice and more practice. Organizational setups were tried. If they worked, they became SOP. If not, they were scrapped and new ones put in. Personnel had to be gathered and trained. Radar, brand new as an offensive weapon, had to be explored and understood. The 9th also was being thrown into battle as fast as its units were organized, to supplement the work of the combined strategic bomber offensive of the 8th Air Force and the RAF. According to our doctrine, the Luftwaffe had to be overcome if our invasion was to stick. D day was drawing constantly closer and the 9th found itself in the battle up to its neck.

Up through the summer of 1943, the Germans constructed several hundred large airfields throughout France, Belgium and Holland, many of them along the coast. Fighters from these fields attacked our bomber formations in swarms from the moment they crossed the Channel. If they could be driven back from the coast, our bombers could fly farther in safety, their losses would be fewer, and they would be able to drop more bombs on their targets.

The mission of the 9th bomber command was to hit these coastal fields. By the end of 1943 the endless task of filling up cratered runways, repairing hangars and living quarters and the mounting piles of twisted planes was given up by the Germans and the air over the Channel was ours. Additional work eliminated great numbers of flying bomb sites along the Calais and Normandy coasts. When the Germans abandoned "ski-sites" and started to use portable sites for launching V-bombs, the scale was too small to affect the course of the war.

The stage was now set for the greatest amphibious assault ever undertaken by man. The problem was to pour men and equipment ashore fast enough so that they could overwhelm enemy troops, then dig in to avoid being thrown back into the sea by the first enemy counterattack. From then on, it would be necessary to siphon men and equipment into the beachhead faster than they could be brought up from the interior by the enemy. In this way, we would be able to gather sufficient strength to break out of the beachhead and engage the foe in a war of movement.

An anti-railroad and anti-airfield campaign appeared logical. In a few months of concentrated blows we hoped to eliminate the Luftwaffe entirely from the battle area, and to so wreck the transportation system that troops could not be moved in fast enough to oppose our build-up. The task was a colossal one. There were a couple of hundred airfields to be hit, each one a difficult target to knock



An American plane, caught in its bomb blast, burns in the background after successfully having breached a vital Nazi railroad line to help keep supplies from coastal units.

out. And it was hard to stay ahead of the enemy, who can fill in holes almost as fast as you can make them.

The rail problem was even greater. Northwestern Europe has a more complete network of railroads than any other part of the world. Germany had augmented the regular crews for dealing with wrecks and washouts with extra workmen who stood by to make immediate repairs. Germany was well supplied with locomotives and rolling stock stolen from occupied countries. Her lines of communication had shortened and we had the added problem of distributing our blows in such a way as not to betray where we planned to attack.

Despite these obstacles, the air attacks were most successful. The German air force operational efficiency reduced considerably, many fields were abandoned. The toll of enemy aircraft destroyed during the first six months of 1944 reached the staggering total of 6,053. These attacks supplemented the strategic campaign against the German aircraft industry.

As D day came closer, and as our rail effort became more and more concentrated, it became harder and harder for the Germans to keep up. Our pattern for interdiction had been developed during the Italian campaign. It was essentially a series of sharp one-two blows against the supply network of the enemy, driving him from railroads to motor trucks, then smashing the trucks; backing up rail traffic, then going after piled-up traffic.

On 6 May, the focus of bomber attacks on rails was considerably narrowed. From the 15th on, airfield attacks were confined to those within a 130-mile radius of Caen to compel German fighters to operate from bases at least as far distant from the beachhead as those of the Allies. To obtain more detailed knowledge of the beaches selected for the landing, "dicing" missions were flown in P-38s with cameras mounted in the nose to take a picture every five seconds ahead and to the side of the planes. The pictures revealed mines with trip wires attached to obstacle posts, gun positions in the sides of cliffs and weak spots in the defenses.

NOW the tactical air forces turned their attention to the bridges over two rivers, the Seine and Loire, which completely cut off Normandy and Brittany, with the exception of a small gap near Paris. If rail bridges across these streams could be destroyed, the enemy would have to spend an enormous amount of time, unloading freight and troops, taking them across the rivers by boat or pontoons, and then reloading them on trains waiting on the other side. Not only would this slow up movement but tie up a much greater number of locomotives and cars. By D day all the rail bridges on the Seine from Paris to the sea were down, and more important, kept down by a variety of attackers from fighters to heavy bombers. One bridge at Rouen was smashed and rebuilt seven times without ever stay-

ing up long enough to be of any use to the enemy.

For D day itself, an air plan of great complexity and scope was developed. A constant fighter cover protected the convoy from the air, directed from a control ship in the Channel. During the night, two American airborne divisions dropped near the base of the Cherbourg peninsula and a British parachute division dropped on the Orne river near Caen. Also during the night, the RAF Bomber Command with its entire strength saturated five selected rail yards in the immediate invasion area.

At dawn, 1,200 heavy bombers began plastering the beach defenses themselves. This latter operation was a delicate one. It was realized that direct hits on defense installations with more than five per cent of the bomb load were unlikely, and that confusion and panic among the defenders would be the real dividend from the operation. The invasion force waited 1,000 yards offshore during the attack and drove to the beach after the last heavy had dropped its bombs.

AIR followed ground right into the beachhead. By D plus 2, an emergency fighter strip had been cleared by aviation engineers, one company defending the strip while the rest of the battalion worked on it. Others soon followed.

Troops and supplies were meanwhile poured into the beachhead in an unending stream. Units of another American Army, the Third, began to arrive. Allied personnel in the beachhead became almost solid, as scattered German troops in well camouflaged hedgerows permitted only the slowest and most painful advance.

By the middle of July, the schedule had gone so alarmingly out of whack that the air forces were persuaded to dust off a bombing technique known as carpet bombing, a technique which had been tried and had failed at Cassino earlier in 1944. Carpet bombing consists simply of dropping such a heavy concentration of bombs in a small area that the defenders are stunned and demoralized for a short time. Before they can recover, our troops are supposed to rush in and mop up. At Cassino, the Germans simply had retired and then beat us back into the carnaged area. In Normandy, they were not so successful and before the dazed German troops could recover their senses, the First Army had poured through the hole in the dam at St. Lo and the race was on to exploit the breakthrough.

It is not unreasonable to state that the carpet bombing at St. Lo changed the complexion of the war in France almost overnight. The paralysis of the hedgerows ended abruptly, to be followed by a war of extreme movement in which the American air-ground team was given its first chance to show its stuff.

The First Army, under an umbrella of 9th TAC fighter bombers, widened the gap, charged a short distance south, then curled east in a giant wave, rolling up the German flank as it went. It was in



The Tactical Air Force showered this devastation on the railway yards at Limburg.

danger of being cut off by a determined counter-attack at Avranches but the air ended this threat, pulverizing concentrations of enemy troops and armor as fast as they were formed. A week after the breakthrough, Patton's Third Army followed the First through the gap and roared south as far as the north bank of the Loire River. After a swift mopping up operation in Brittany, it too turned east and embarked on one of the most remarkable end runs in modern warfare.

There were numerous lifted eyebrows in military circles at this rash maneuver, which apparently proposed to ignore the threat to Patton's flank of large enemy forces south of the Loire. But Patton had discussed the matter at length with the chief of the 19th TAC, which was to cover his advance.

"I am going to forget completely about my flank," he said, "if you can guarantee to protect it for me from the air."

"I can do that," replied General O. P. Weyland, head of the 19th TAC, "if I have the weather."

Patton took off. In a little over two weeks he had reached Paris. The weather held. In a month he was within 60 miles of Germany.

Throughout August and into September, the tactical air commands operated at maximum strength. The 9th Bombing Division worked hard to close the Paris-Orleans gap in the interdiction line, at the same time hammering the Loire bridges. It

now found itself virtually hamstrung in the extremely fluid situation which developed. It was forbidden to attack any more bridges, as our rapidly moving ground forces confidently expected to use them, and was reduced to further blows at the battered but surprisingly resilient rail system of northwest Europe. But the TACs went on a spree of destruction. Fluidity was their dish. It forced the Germans to move out into the open. It created vast pockets of troops and vehicles which were being squashed together between British ground forces and the First American Army.

Patton's and other armored outfits were covered by tactical air power in their rush across France and into Germany. Close cover for an armored column is a specialized business. The incoming flight must know just where the column is and must be able to identify it. This is usually done by the use of colored panels displayed by the tanks. Colors must be changed daily (the Germans were soon detected displaying panels of their own).

The flight must check with the flight which it relieves for the location of targets suitable for dive bombing, also with the air liaison officer riding with the tanks, to find out where the column is being held up and where it needs help. It must know where the tanks are going, and range ahead of them to spy out concentrations of enemy armor which may give them trouble.

October and then November rolled around, and with them a gradual deterioration of weather. The Battle of France was over. The airborne operation to flank the Siegfried Line was only a partial success. The ground armies were now faced with the problem of hacking their way through an imposing barrier of natural and man-made defenses. Bitter battles were fought and progress was painfully slow.

The character of the tactical air war changed almost overnight. The relation of TAC to army became even more intimate as ground made even greater and more diversified demands of air to help rout the sullen Hun from his deep concrete nests. The operations of the TACs during this period fall into four main classifications: tactical reconnaissance, photo reconnaissance, fighter bomber and night operations.

Tactical reconnaissance was in the main flown by P-51s. Their job was to patrol certain designated areas over enemy territory and to report all enemy troop and rail movements therein, also to report immediately the location and nature of any enemy targets suitable for fighter bombing or strafing and to photograph the results of such attacks. In addition, they spent many profitable hours adjusting artillery for the ground forces.

Daylight reconnaissance was done largely by P-38s. The variety of uses to which their photography was put is amazing. They supplied the armies with basic coverage, front line coverage, road and river strips, "dicing" strips and obliques of various kinds. They also gave target, strike and bomb damage assessment photographs. With the battle area covered with snow and the enemy well hidden, the value of photography in this phase of the war cannot be overestimated.

THE performance of these manifold and delicate tasks sounds easy. Actually, if it had not been for radar, their coordination would have been incredibly difficult, and impossible under the weather conditions which prevail in western Europe in winter. The use of radar in military operations is in its infancy, but it has already permeated every phase of air warfare. It was used for strategic bombing by both British and American heavies. It makes night fighting and intruder operations possible. It literally saved England in the Battle of Britain. And it provided for the control and direction of virtually every day or night sortie flown by the TACs during the past winter.

As winter closed in on the Western Front, ground progress nearly halted. The Third Army had succeeded in getting past the Metz forts. To the north the First Army had captured Aachen. If it could burst through to the Cologne plain, it could expect to get up the Rhine without difficulty. But the Roer River, the Hurtgen Forest, and several strongly defended towns stood in its way. To smash this formidable barrier, the largest carpet bombing

attack yet planned was laid on in nine saturation points in a triangle between the towns of Linnich, Eschweiler and Duren.

This gigantic effort should have sprung the First Army into the Cologne plain but did not due to failure of the bombers to hit close enough to American troops to soften the enemy defenses directly in front of them and failure of our troops to push ahead with both infantry and armor while the fleeting psychological effects of the carpet still persisted.

WHILE a large-scale attack by Patton was being planned, the Germans under von Rundstedt counter-attacked in the Ardennes. It was the first time American air power had been assigned a large-scale battle mission not planned in advance as part of an offensive. The Germans counted on bad weather to limit Allied air activity, and must certainly have had forecasts of the zero-zero conditions which prevailed from 18-22 December.

The weather was atrocious, with the entire area socked in tight. By December 23 the situation was critical. Luckily an unexpected break in the weather came, lasting until 4 January. The hungry TACs made the most of it. The importance of channelling the enemy into a few roads now became apparent, and these roads were worked over with fury and thoroughness. Meanwhile heavy and medium bombers plastered towns, road junctions, airfield and rail installations east and west of the Rhine.

Although it flew an impressive number of sorties, the German air force was generally ineffective throughout the period. It failed entirely to interfere with our operations, and was only of a minor nuisance value in the air. The paralyzing attacks of our fighter bombers finally caused it on 1 January to make a large-scale strafing effort against our airfields which netted 127 Allied aircraft destroyed on the ground and 133 damaged. Of the 800-900 enemy planes involved, about 200 were destroyed in the air.

Between 24 December and 16 January, our tactical air forces hit 20 German airfields, interrupting operations for an average period of six days per airfield. Altogether we lost 592 aircraft in the first four weeks of the Battle of the Bulge. 50 of those in the air. Against this we claimed for the same period 1,392 destroyed, 129 probably destroyed and 418 damaged.

The advancing infantryman, observing swarms of friendly aircraft with scarcely a sign of the enemy overhead, looking about him at roadsides littered with the hulks of charred trucks, tanks, self-propelled guns, and at one blasted supply dump after another, could see for himself what the TACs had done to help. Truly, the Bulge provides evidence *ad nauseam* that the field manual is right: you can't fight a campaign on the ground today without superiority in the air.



German planes, caught on the ground by our fighters, burn on an airfield near Munich.

With the Ardennes again in Allied hands, the ground forces resumed their task of crunching forward to the Rhine. The battles of the Roer and Saar rivers were the last the Wehrmacht was to fight in the West with any degree of vigor. The iron tentacles of our forces kept curling farther and farther to Frankfurt-on-Main, Mannheim, Muenster, Hanover, Gotha, Schweinfurt, to places which not so very long ago were at the extreme limit of heavy bomber range.

Gone by 20 April, through strategic bombing or capture, were 90 per cent of Germany's steel capacity, 85 per cent of her iron ore, 95 per cent of her hard coal, 100 per cent of her ferro-alloys, 100 per cent of her coke, 80 per cent of her lignite, 95 per cent of her fuel, 95 per cent of her synthetic rubber capacity, 70 per cent of her tire manufacturing, 55 per cent of her tank manufacturing, 75 per cent of her truck manufacturing. And as each day passed, these percentages were growing higher.

By 20 April, 55 per cent of all airfields in Germany had been captured. German aircraft were being crowded into fewer and fewer fields as each day passed, which, together with the excruciating fuel shortage, explains why in the first 18 days of April our air forces were able to destroy 3,121 German planes of all kinds, only 400-500 of them in the air. This merciless clobbering, plus the fact that 35 to 40 per cent of the aircraft industry had been captured and a great deal more lay in ruins from bombing, meant that the Luftwaffe finally had ceased to exist as a fighting force.

From 16 April on, the U. S. Strategic Air Forces joined in playing a solely tactical role. Germany saw the final result of what she began when her dive bombers screamed down on Warsaw, Rotterdam and Coventry. What Germany had been able to dish out was literally microscopic compared to what she got. Her bombers destroyed only 17 per cent of London. Fifty-six large cities in Germany were 50 to 80 per cent destroyed by Allied bombing.

Thus, as it turned out in the final accounting, German air planners had made some crucial errors. They had overestimated the power of their air force and underestimated the potential power of the Allied air forces. They had failed to concentrate on gaining air superiority before proceeding with other air plans. They had failed to plan properly in the sense that we planned a truly strategic bomber offensive, aimed at Germany's war industry, while the Germans, in the battle of Britain, bombed almost indiscriminately. They had failed to organize air-ground cooperation to the extent that has made the Allied tactical air forces so successful. And, finally, in their insufficiency in the realm of ideas, they failed to discern even faintly on the horizon the overwhelming might of the strategic air power that shackled their aircraft production and left them without fuel to fly.

As the proud TACs roamed at will over the flattened foe, and as they were joined by the strategic air forces in mid-April, the scene in Germany was one of air power triumphant. Only the mopping up remained.

END

Amphibious Engineers

Flexibility in the engineer

regiment means the assignment of specific tasks to the various components, with the retention of a reserve to handle the unusual or unexpected.

By LtCol H. D. Adams

SINCE amphibious operations by their nature are highly decentralized in the initial stages, it is necessary to plan in minute detail for any contingency which may arise, in order that the efforts of all units may be coordinated and concentrated toward the accomplishment of the mission. In no phase of planning is this more evident than in the development of the engineer plan. There never seems to be enough engineer troops available for the multitude of vital tasks.

In general terms, the mission of engineers as set forth in FM 5-6 (Operations of Engineer Field Units) is "to increase the combat power of our forces by construction or destruction which facilitates the movement of friendly troops or impedes that of the enemy."

ANALYZING this statement, certain more specific duties which engineer troops perform become apparent. These duties may include the construction, repair and marking of roads and bridges to permit adequate movement of troops and supplies; provision of a sufficient supply of water to all units; performance of heavy demolitions beyond the capabilities of infantry units; construction of obstacles in defensive situations and, in some situations, defense of those obstacles; technical assistance in the laying and clearing of mines and in camouflage; and the establishment and operation of an engineer dump. By application of these duties to a given problem, specific tasks may be deduced. The application of the means at hand to these specific tasks will provide the basis for the engineer plan.

The means available for engineering work within a Marine division include the engineer battalion organized as shown in Tables of Organization G-31, G-34, and G-35. The pioneer battalion is primarily concerned with the operation of the shore party, and will not be available for any engineering tasks until they have been relieved of their shore party functions. The division may be reinforced by the addition of a Marine separate engineer battalion (similar in organization and equipment to the division engineer battalion), a naval construction battalion, or Army engineer troops if available. These reinforcing troops will probably revert to control of a higher echelon early in the operation and can only be depended on for engineering work in the rear of the division zone. Engineer troops may be issued special equipment, such as bridging, for a specific operation.

Before developing a plan, it is necessary to study features which it should contain. Immediately two apparently contradictory requirements of the engineer plan present themselves; that it be flexible enough to permit the adequate meeting of unforeseen developments, and that it give a specific assignment of tasks so that the maximum effect of the engineer effort may be realized. The requirement of flexibility can best be met by the retention of adequate reserves under centralized control. These reserves should be capable of reinforcing the troops assigned specific tasks if necessary or should be available for assignment to tasks which develop during the operation. Therefore, if flexibility is to be acquired, a decision must be reached as to what part of our available forces should be retained as a reserve. The remainder of the force should be assigned to specific tasks of the highest priority.

In developing the engineer plan, the division engineer must work closely with other staff members, both general and special. The background and foundation on which a great deal of the planning is based is a thorough and detailed study of the terrain. This terrain study is prepared in close cooperation with G-2, using the information furnished by higher echelons and supplemented by aerial photograph interpretation. The engineer is particularly interested in the existing road net and bridges, drainage system, water supply, type and trafficability of soils, location of forests and swamps, location of engineering materials, and weather. This information must be as detailed as possible.

AFTER development of the terrain study, the engineer must know the scheme of maneuver so that he can anticipate the specific engineering tasks which will best assist the advance of our troops. The engineer sees where the troops are going. Then, by the knowledge gained from the terrain study, he sees what obstacles of an engineering nature must be overcome. He sees what bridges must be built or replaced, what roads must be constructed or repaired, what water points must be established, what dump sites constructed, what obstacles and minefields constructed or destroyed, and what heavy demolitions accomplished. These tasks must be assigned priorities in the event that sufficient engineer troops are not available for the simultaneous accomplishment of them all.

The next step calls for the engineer estimate of the situation, the form and contents of which are

set forth in FM 5-6, paragraph 13. It should be pointed out that the decision, which is the basis of the engineer plan, should show the detailed requirements in time, troops and materials for each task, and assignment of responsibility for the completion of a task to a certain unit.

Having completed the estimate, the engineer then develops a plan to include details of the assignment of available troops and the allotment of available materials, transportation, and equipment. The plan must be comprehensive, flexible and simple. The form for an engineer plan is shown in "Staff Manual 1945 (NAVMC 1022 DPP—Revised)." Three appendices to the plan will probably be necessary: the first—information of an engineering nature of particular importance to the operation; second—a map or overlay showing the location of each assigned engineer task and assigning numbers to the tasks; and third—a table showing the task its priority, and a detailed assignment of troops, materials, and equipment.

THE development of the engineering plan and its appendices must be accomplished in extremely close cooperation with the general staff members. The engineer must learn the following from the general staff: G-2—Terrain study and enemy information particularly as concerns fortifications, large obstacles, minefields, examination of captured engineer equipment; G-3—Scheme of maneuver and a priority of engineering work of greatest importance to the tactical situation; G-1—Location and construction of CPs, POW enclosures, and civil affairs installations; and G-4—Assignment to shipping, location and construction of administrative installations, water supply, and traffic control.

Planning must go into minute detail. For example, certain lengths of roads with a certain number of bridges within our division zone exist. FM 25-10 (Motor Transport) explains what type of road signs are necessary. (It may be modified by an SOP of a higher echelon.) Through G-4 and the provost marshal, the requirements for road signs must be determined, construction initiated, the engineer must see that they are carried by the proper units, and that they are properly used.

Emphasis has been placed on the amount of detail into which the plan must go and the detailed assignment of troops, material and equipment to tasks. It has been pointed out that the necessity for flexibility in our plan requires the keeping of a reserve of engineering troops to be used to reinforce troops assigned to specific tasks or to undertake tasks which have not been anticipated. If the planning has been thorough and complete, the maximum assistance to our division with the engineering troops available for the operation can be achieved.

END

Presenting The Stinger

By Pfc V. G. Spalding



THIS is the history of the "Stinger"—a new infantry weapon—conceived under fire on one island, built on another, and proved on a third—Iwo Jima. This is a tribute, also, to the Marine whose proficiency and ingenuity with weapons is exemplified by the terrific potency of his weapon, the Stinger. He is Sgt Mel J. Grevich, USMCR, of Mt. Iron, Minn.

The Stinger is a light machine-gun with almost incredible fire-power—1,350 rounds per minute, 22-1/2 rounds per second—more than double the cyclic rate of the Browning A-4. It is an aggressive weapon, for it is as portable as the BAR, weighing only 23 pounds.

The original Stinger was devised on Bougainville, to meet an urgent need for a light, high fire-power weapon for patrol operations in the jungles. Combat and security patrols of the 3d Parachute Battalion took heavy casualties when Jap positions or patrols were come upon suddenly in the dense growth, where visibility was limited to a few feet at best. At such close quarters, the point of the patrol needed immediate fire superiority, or else.

The weapon to meet these needs was found by Sgt Grevich and his platoon leader, Lt Phillip Gray of Jewell, Ore. (later captain, who died of wounds received in action on Iwo as CO of Company I, 27th Marines), to whom Sgt Grevich insists

(Continued on next page)

equal credit is due for the original idea. The gun they found was an aircraft machine-gun, the Browning Model 1919 A-2, mounted on TBFs and SBDs. With the aid of a friendly pilot, they dismounted a gun from a damaged SBD, fitted it with an M1 stock and front sight, BAR bipod and rear sight, and an improvised trigger. This gun was never used on Bougainville, however, for it met with opposition from higher echelon, and the project was abandoned.

The 3d Parachute Battalion returned to the States after Bougainville, was disbanded, and the paratroopers reassigned.

NOVEMBER, 1944, found Sgt Grevich again overseas, as MG ammunition sergeant with Company G of the 28th Marines, 5th Division, which was then preparing for the Iwo operation.

As training progressed, Sgt Grevich became more and more dissatisfied with the performance of the light machine-gun sections when close cooperation with the rifle platoons on assault problems was involved. The A-4 was heavy and difficult to set up. Its use was usually limited to overhead fire. Worse yet, the three men required to operate it were frequent casualties, for they were particularly vulnerable while setting up their positions.

Sgt Grevich recalled the weapon improvised on Bougainville. Here was the machine-gun that could move up with the riflemen, would take little time to set up, and supplied its own covering fire when it moved. Moreover, its fire-power was greater than that of the A-4, though even Sgt Grevich was not yet fully aware of the lethal capabilities.

Capt R. B. Carney, CO of Company G, realized at once the possibilities of Sgt Grevich's proposed weapon. His authorization secured, and a number of dismounted A-2s located at the nearby NAS at Hilo, Hawaii, Sgt Grevich went to work building Stingers. By working night and day, he managed to improvise six guns by the time the 5th Division sailed for Iwo. With the first one completed, he put on a demonstration that completely convinced Capt Carney and LtCol C. E. Shepard, CO of the 3d Battalion.

Sgt Grevich selected and trained gunners, and worked out a basic operating procedure. Instead of assembling the Stingers in a section by themselves, one gun was assigned to each of the three rifle platoons and one to demolitions. The fifth gun was carried by Sgt Grevich and the sixth by a machine-gunner in Company A of the 28th.

The pre-invasion naval gunfire and aerial bombardment of Iwo had knocked out most of the heavy

gun positions, but left too many of the pillboxes intact. These had to be taken the hard way—by assault. They were so cleverly camouflaged that, occasionally, the troops found themselves under fire from front and rear simultaneously when some overlooked position opened fire on them.

The Grevich technique for pillbox reduction: the Stinger man wormed his way as close to the position as possible, usually within 20 yards, and opened fire on the facing aperture. The demolitions man moved in under this covering fire and threw his charge through the aperture. Sgt Grevich personally covered the demolition of four pillboxes during the first five days of action.

In addition to this important job, the Stingers performed capably in every other duty required of either a shoulder weapon or machine-gun. They were particularly effective against enemy personnel, since the gunner could hardly touch and release the trigger before 10 rounds were fired.

Three Stingers were assembled at Bloody Gulch, and for the remaining 15 days of action operated as a machine-gun section under platoon control.

Happily, our need for Stingers and other weapons is now past, save for occupation duty in the home islands. And other changes came with the end of hostilities. Company G has been renamed, is now Company K. Sgt Grevich is now on his way to the States for a well-earned point discharge.

The Stinger shown on page — is the one carried on Iwo by Sgt Grevich. Some of the camouflage paint still shows. A box, used when the gun is moving, carries a short belt—100 rounds. When the gun is set in a position, a standard 250-round machine-gun belt is used. The barrel on this weapon is No. 4. This gun has fired some 20,000 rounds. A barrel burns out in about 6,000 in normal, not sustained, firing.

THE gun was fired most often from the prone position, of course, though Sgt Grevich frequently fired from the hip, when moving.

Sgt Grevich was a sort of one-man demolitions platoon. He operated his Stinger only for the first five days, for NCO casualties mounted, and he was attached to the 3d Platoon as guide. He took particular pleasure in attacking the Nips in their caves with whatever weapon he fancied at the moment—Stinger, bazooka, flamethrower, AT grenade, hand grenade, or satchel charge. A Marine's diary records D+32 as the day "Grevich sealed two dozen caves with C-2." He even performed capably as a corpsman. He was awarded the Bronze Star Medal for gallantry in action on Iwo.

Judo, Japanese fencing and Samurai traditions are no longer a part of the Japanese educational system. Instead the schools are replacing these militaristic subjects with English, Chinese government and occidental sports.

A Brief History of Rations

Marines griped about their food in the field even during the Spanish-American War when rations got their start.

By LtCol R. M. Tompkins

WITHOUT reference to that much abused adage that an army, "travels on its stomach" the problem of feeding an expeditionary force is a tremendous one.

The combat ration, as we know it today, is a comparatively recent innovation. To obtain a proper perspective of its development, it is necessary to examine briefly the early rations of the armed forces. Prior to World War II there were the emergency ration, the reserve ration, the trench ration and the Armour or "iron" ration.

The emergency ration was developed in 1896 and made its appearance during the Spanish-American War. It consisted of bacon, hard bread, pea meal, and roasted coffee. The reserve ration arrived with World War I and had 16 ounces of hard bread, 16 ounces of canned meat or pork and beans, sugar, salt and coffee. This ration was too hard to carry; the container was too heavy; the contents were unpalatable and far more than one man could eat.

World War I also produced the trench ration which was similar to the reserve ration but designed to alleviate the danger of gas contamination. This item combined 25 rations in a single large metal container. Although greater variety was provided and solidified alcohol was included to heat the foods, the bulk and weight of the trench ration made it difficult to handle. Again, the contents were not packed for individual meals. (Both the reserve and trench ration used canned products.)

THE Armour ration, also developed in World War I, consisted of three 3-ounce cakes of a mixture of evaporated beef powder, cooked wheat kiln dried and parched—compressed into a homogeneous mass, and in addition three 1-ounce cakes of sweet chocolate. This ration owed its inspiration to the Mexican and Indian raiders of the Southwest who, while on forays, were accustomed to subsisting on jerked beef and pinole. In an effort to develop a similar sustaining, highly concentrated food, the Armour ration was born. It was designed as an emergency ration, and on the testimony of hardy souls who have successfully undergone the experience, it would be a dire emergency indeed that would force a man to eat the mixture. The Armour ration was used only in the latter part of World War I, some 2,000,000 rations being shipped to France between June 1918 and the armistice. In 1922 this ration was eliminated and the reserve ration established as the standard emergency ration.

From the close of World War I until 1934, little

was done to provide a combat ration as such. Shortly after the close of the war the Army Quartermaster Department began a study to improve the standard reserve ration. No attempt was made to balance the ration or to make it nutritionally complete. The minds of the planners were dominated by the tactical concepts of the stabilized type of warfare just concluded and it was believed that the soldier would not have to subsist on the reserve ration for more than a day or two at a time before having access to the regular food supply.

BUT the blame can scarcely be laid wholly at the door of military planners. The war had been "won" and, as usual, after the termination of any conflict in which this country has engaged, the nation was swept with an intense wave of pacifism and desire for reduction of expenditures. The military gentry were regarded with suspicion and distrust; adequate appropriations for development of the vital tools of war were lacking and the United States quietly went to sleep.

In 1934, however, the Army Quartermaster Corps managed to have the munificent sum of \$7,500 earmarked for the development of a balanced combat ration to replace the now obsolete Armour ration of World War I. After three years of intensive research and development, the modern Type D ration was produced in 1937 and officially adopted in 1938. The chief ingredients of the D ration are chocolate, sugar, milk powder, cocoa fat, oat flour, and vanillin fortified with vitamin B-1. Each bar weighs four ounces and three such bars make up one ration (food for one man for one day). The D ration is a highly concentrated ration containing 80 calories per unit; it is intended to sustain a man for only a short period of time and is essentially a "survival" ration.

With the standardization of the D ration, the Army in 1938 turned its attention to devising a balanced combat ration. Their goal was to produce an individual ration, carried on the person, that would provide three complete meals a day and could be eaten either hot or cold. Plans called for this ration to be packaged in flat rectangular tins to permit easy packing and carrying. Since such tins were no longer being commercially produced in quantity, the ordinary round tin can was utilized. Many difficulties were encountered in attempting to provide the fighting man with a decent combat ration. In the fall of 1938, however, the whole sum of \$300 was actually given to the Subsistence Re-

search Laboratory of the Army Quartermaster Department for development of the combat ration.

On 1 November 1939, the C ration was adopted as a standard combat ration. One ration consisted of three cans of meat component (beef stew, pork and beans, vegetable hash) and three cans of bread component (biscuits, coffee, sugar, and candy). Again it was believed that the troops would have to subsist on this ration only a few days at a time.

The C rations were available for maneuvers in 1940 and various minor changes (size of cans, etc.) were made as a result of criticisms received.

In addition to the C and D field rations there were two garrison rations available; A, which contained fresh meat, fresh fruit and vegetables, and other perishables; and B, identical to the A except canned goods were substituted for perishables.

When the First Marine Division (Reinforced) launched the Guadalcanal campaign on 7 August 1942, Operation Order 6-42 called for "10 days C ration; 10 days D ration; 60 days B ration."

Due to a tenuous supply line that was very often stretched almost to the breaking point, the marines on Guadalcanal in the early days of that operation were on short rations and supplemented their diet from captured Jap supply dumps. Instead of living on C rations for comparatively short periods as was originally envisaged, the C ration became the invariable fare for days on end.

Comments from the field were too divergent to form a basis for any definite conclusion as to the efficiency of the C ration under combat conditions. One observer, reporting from Guadalcanal during October-November 1942, stated that "the C ration was universally detested by the men after subsisting on it for four or five days." Another observer, reporting from the southwest Pacific, stated that "the C ration is working out wonderfully well." In spite of conflicting reports, however, there was no diminution of research to improve the ration.

German successes in the early days of World War II opened eyes, long devoted to the stabilized fronts of World War I, to the war of movement and the so-called blitzkrieg tactics employed in Poland. It was concluded that the C ration was too heavy and bulky for mobile assault troops and experiments were undertaken in 1940 to develop a pemican type ration.

EARLY attempts were not too successful, however, and in June 1941, were abandoned in favor of developing a new type ration which finally resulted in the K ration. The K ration was formally adopted in May 1942 and large scale procurement was under way by the fall of the same year. The K ration consisted of three paraffin-coated, rectangular cardboard boxes each containing one unit labeled "Breakfast," "Dinner," "Supper."

The K ration at first provided a very welcome change from the monotonous C ration, but still was far from being the ideal combat ration; the biscuit

component of the K ration especially being singled out for criticism. Development of the K ration continued unabated. The years 1942-1943 saw development and abandonment of the jungle (J) ration, the mountain ration, and the 5-in-1 ration.

Although the idea of packaging some of the components of the B ration had been suggested as early as 1941, the project lay dormant until early in 1943 when it received impetus from two sources—first, the success of the British compro ration (14-in-1 ration) during the 1942 North African campaign, and secondly, a search for simplification of existing types of rations. Accordingly, the best features of the old 5-in-1 ration were incorporated into the new 10-in-1 ration which was adopted in June 1943.

THE 10-in-1 ration contained food for ten men for one day in a carton weighing 45 pounds and offered a considerable variety of food. It was enthusiastically received by the troops in the field. However, the 10-in-1 ration is intended for issue to small groups who can prepare their meals together; the cans of vegetables, for example, are of a commercial size rather than the individual size can. The 10-in-1 ration therefore is intended primarily for troops not actively engaged with the enemy and as a supplement to the standard C or K field ration.

Being fully aware that morale is raised or lowered by the quality of the ration supplied, the Army continued to develop the field ration in the light of comments, suggestions and criticisms received from every theater of operations where American troops were engaged. Technical developments in canning processes, as well as continued research of the reaction of canned and dehydrated foods when subjected to extremes of temperatures were instrumental in producing superior field rations.

In 1944, a new C ration made its appearance. Whereas the original ration had but three meat components and one bread component, this new version had no less than ten meat components (including such delicacies as chicken and rice, hamburgers), six different bread components, and an accessory pack containing cigarettes, matches, toilet paper, gum, and water purification tablets. This new C ration enjoyed instantaneous success. An officer returning from Okinawa reported that the troops considered it "better than garrison ration served in the Hawaiian area."

The end of the war found an "assault lunch" and a new combat ration in the process of development. Neither of these rations had been standardized, however. Experimental prototypes of the assault lunch (hard candy, chocolate, matches and cigarettes in a cellophane bag) were issued to marines for the assault on Saipan in June 1944.

Even if the inevitable happens once again and we are forced to begin the next war with the rations with which we ended World War II, the prospects of eating well in the field will be far brighter than they were on 7 December 1941.

END

Developing the Fire Team Adaptation of the

British Commando's "buddy" system by Marine officers brought an increase in control of small infantry units fighting the Pacific island war.

By 1st Lt Lewis Meyers

THE amphibious operations of the Pacific, and the weird and varied terrain that lay behind the beaches, tested the foot troops in many ways. It was a system of intensive, decentralized control of the fire team system that permitted Marine infantrymen to adapt themselves to the problems of each landing. It was an important factor in their success in overcoming jungle, sand, and rocks; the pillboxes and the caves; and the enemy who defended them to the end.

Increased control of small infantry units was first developed in the recent war by the British special service troops—the commandos. They adopted a principle of close and constant companionship; from the beginning of commando training, men were paired off and shared all with a comrade. The success of those troops in combat was due in part to this system—to the silent and immediate cooperation of two-man teams. No type of discipline could produce the same result.

Marine officers observing commando training early in the war were impressed; they adapted this "buddy" system to a three-man group to be later employed by Marine Raider battalions in jungle combat against the Japanese during 1942 and 1943.

At the same time, the Marine Corps began the development of a "fire team" system which eventually was incorporated in a rifle squad manual published at the Marine Corps Schools. During this period Marine units in the field had varying success in experimenting with intra-squad organization.

In the spring of 1943, the newly activated 24th Marines were training at Camp Pendleton, Calif. Commanding Company L was Capt (now Maj) Houston Stiff, veteran of Tulagi and Guadalcanal with the 1st Raider Battalion until wounds sent him stateside. From his Solomons experience, Capt Stiff brought back ideas which were to affect the training of his new company, and eventually of the regiment. He had seen that control was a major problem in the Pacific, as far as infantry units were concerned. Also, he had been convinced of the value of the three-man Raider groups.

THE obvious conclusion was to apply this group system to the infantry control problem, which Capt Stiff did. At that time the Marine rifle squad had a T/O strength of 12 men, including a sergeant squad leader and a corporal assistant. Ten of the squad were armed with M1 rifles and two with BARs.

Carrying the triangular organization to the lowest

denominator, Company L utilized the Raiders' three-man group, breaking down the squad as follows: squad leader, a sergeant; scout group, a leader and two scouts; two fire groups, each with a leader and two men, one of whom was armed with a BAR, and one support group, a corporal and a rifle-grenadier.

These groups were constant as much as possible. The three men in a group were together—in quarters and bivouac, on mess duty, on working parties and guard details, and even on liberty. The aim was close cooperation based on mutual understanding.

UNDER the old squad organization, the squad leader directly controlled more men than any company officer, since he gave orders to 11 men, or at least six (half the squad plus the assistant, who led the other half). With the group system the squad leader gave orders to his best men—the leaders of the four groups.

Advantages of the group system in contrast to older methods were summarized as: better control under all conditions; more accurate fire and better fire discipline; training of subordinate leaders; development of teamwork within the squad; and more direct training in fire and movement.

In a training camp, it often was difficult to keep groups intact, though the framework remained constant. But in the combat zone the solidarity of the group was much stronger, as transfers and special assignments were at a minimum. Only casualties could destroy a group.

At Camp Pendleton, when the groups of Company L were drilled in extended order, the standard squad formations were adapted to deploy the groups, rather than individuals. This was followed by developing a set of squad "plays." Under the group system, the squad leader has his unit pre-arranged for formation of a base of fire or for maneuver, or for both. The plays gave set methods of performing fundamental tactical movements. In accord with the leader's estimate, the groups moved into position for flanking movements or envelopments or direct assault. These plays were rehearsed many times—at first slowly and repetitiously, later under simulated tactical conditions.

Most of the men of the company were fresh from boot camp and then entered into the group maneuvers with enthusiasm. In fact, this revealed a dangerous trend in the system—that of regarding it as a type of "combat football," where the squad leader called a play and the groups galloped into position

like high school halfbacks. Such mechanical precision would not be of value in combat. These tendencies, however, were curbed by moving the training program into the rocks and cactus of the Pendleton hills. A year later, these same groups worked in the same manner over similar terrain but under different conditions—on Saipan.

Far from being a set system of fighting, the group theory was designed to overcome an enemy who fought by the book. Flexibility was its biggest asset, capitalizing on that flexibility of mind which BrigGen Merrit A. Edson, in the first year's fighting, had noted as an important American advantage in the Pacific. The three men in a group were working together under the leadership of the best man in the group. Individual ingenuity could be employed, supported by two comrades who could be relied upon. Within the former squad organization any individual action created confusion and caused the squad leader to lose control. The unit became a scrambled squad of individual fighters, with no man sure of what another was doing.

Running firing problems with silhouette targets at Pendleton demonstrated the group system's more effective application of fire. The first duty of the group leaders was to direct the fire of their men, before opening fire themselves. This resulted in more hits and fewer shots. Other apparent advantages were that the groups in motion presented dispersed targets, and the fact that the triangular formation of each three men was ideal for defense.

Throughout its training, Capt Stiff's experimental organization was being observed by the battalion commander, LtCol (now Col) H. L. Litzenberg, Jr. Finally, after a series of demonstrations by an L Company platoon, the colonel adopted the group system for the battalion, and I and K Companies were organized accordingly.

FURTHER demonstrations of the system were given by the 1st Platoon, Company L, and eventually resulted in the approval of the system by the regimental commander, Col (now BrigGen) F. A. Hart. A manual for instruction in the Fire Group System was issued by the 24th Marines at Camp Pendleton in September 1943. This contained an introduction, basic plays, a section on the changes needed in certain paragraphs of FM 22-5 to adapt them to a squad with groups, and a section adapting parts of FM 7-10 for units with the group system.

The regiment, as part of the 4th Marine Division, saw its first action on Namur in the Marshall Islands early in 1944. In the final month of training before embarkation for the Marshalls operation, the lessons of Tarawa caused a rapid change in some of the tactics, organization, and equipment in the division. Emphasis was placed on preparing to assault fortified positions on a coral atoll. A resultant personnel change was the assignment of an engineer officer and 15 engineer personnel to each rifle company.

Various methods of employing the engineers were devised. Company L's organization for the Namur landing included three 20-man assault teams, each with an officer in command. The group system applied here with success.

THE three rifle platoons in the company now had 10-man squads, each with three fire groups of three men. Each platoon also had a light machine-gun squad and a 60mm mortar squad attached. This reorganization of the company was accomplished easily by moving groups from one unit to another, rather than transferring individuals. Discipline and control did not suffer, although the changes had to be made in the period just before embarkation.

While still in the Marshalls, the company was informed by Col Litzenberg that the Marine Corps had adopted a development of the group system—the present fire team. This organization gives the rifle squad three four-man teams, each led by a corporal. The sergeant squad leader brings the T/O strength of the squad to 13 men.

This system was employed for the rest of the war. Company L used it on Saipan, Tinian, and Iwo. Under the varying conditions of these campaigns, combat revealed some added advantages of the group or fire team system. Through the cane-fields and over the wooded ridges of Saipan, the use of one group as scouts preceding the squad in the advance functioned effectively. Frequent rotation of groups on this assignment was practiced. Individual groups also proved ideal for patrols.

On Tinian, replacements joined units on the front lines. In this situation, which became routine, the group system was valuable, for the new men were assigned to fire teams, putting untried men with one or two veterans. Since many infantry units also had new officers on this landing, the influx of green troops under combat conditions might have been disastrous. But each veteran was able to guide and control one or two of the replacements with little trouble.

On Saipan and Tinian, the ease with which fire teams could carry out the principles of tank-infantry coordination became apparent. The teams provided long-range and short-range support for armor over varying terrain.

On these two islands, and even more on Iwo Jima, the fire teams simplified the problem of supply under fire. One man from a team could slip back for rations and water, thus keeping dispersion at the maximum, even at the squad level.

Finally, on the nightly defensive set-up, the four-man fire team broke down easily into two-man positions. With a group leader responsible for every two holes, there was effective control all along the line during every phase of the defense, from digging in until moving out in the attack. And with officer and NCO casualties heavy, the fire team leaders furnished a steady supply of tested leaders as the attack moved on.

END



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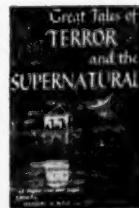
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Our Transport Air Group

**These marines flew in supplies vital
for our Pacific island-hopping drive**

By Corp Theodore Bialock

THEY rang down the curtain recently on one of the epic operations of the war, the cargo-carrying, infantry-supporting activities of Transport Air Group. After 19 months of aerial transport service in which its big twin-engined flying freighters spanned the expanse of the Pacific and saved countless American lives, TAG ceased operations on 1 November. Other Marine outfits are carrying on the postwar cargo work which remains to be done.

The history of TAG is a sequel to the story of Marine conquests of Nippon's empire. When the 2dMarDiv secured Tarawa the activities of TAG commenced. As our forces fanned out from that point over the vast reaches of the Pacific, TAG cooperated and worked feverishly with other air and infantry elements. The progress of TAG, which included the movement of 50,000 pounds of cargo over 2,000 miles of ocean, has not only earned the admiration of Marine infantry, but also of the Army and Navy.

TAG came into existence officially 23 March 1944 as an outgrowth of the Central Pacific combat air transport service. The latter organization was formed in November 1943 as a combat feeder line for assault units which fanned out with the conquest of Tarawa. Entrusted with the task of carrying high priority freight and personnel, TAG's activities first centered around Samoan and Ellice Islands. With the progress of Marine conquests, TAG grew in proportion.

FLYING Douglas Skytrains and Curtiss Commandos, TAG pilots made transport history with their record-breaking 2,660-mile non-stop flight in 13 hours.

Another record was established when TAG moved an entire battle-weary fighter squadron from Midway to Honolulu, hauling their replacements on return trips. Running a 24-hour shuttle service, TAG completed the task in six days. During that period 800 men and 145,000 pounds of freight were moved.

When the battle for Saipan was at its height,

TAG's transports brought badly needed supplies from Kwajalein, hauling 48,000 gross pounds over 1,000 miles of ocean. A TAG ship was the first land-based craft to land on Saipan. The battle was still raging when TAG unloaded its cargo.

With equal vigor, TAG performed works of mercy. As quickly as cargo planes were emptied the wounded were loaded aboard and flown to rear area hospitals.

Maintaining its record of "firsts," TAG landed its Skytrains on Orote Peninsula when the battle for Guam was still in progress. With Guam secured, the area became a staging point for smashes at Palau, the Philippines, and the Jap mainland itself. It was TAG that bridged Guam and rear areas, flying in precious supplies and military personnel.

TAG's heroic acts of the past were repeated at Tinian and at Peleliu in the Palau group. Often, landings were made when the areas were still under enemy fire. TAG broke its own record when an emergency request for help was made from the commander of the Peleliu operation. Heavy storms encompassed the island, balking all efforts to evacuate wounded Marines and the delivery of supplies from surface units offshore. TAG's transports from Saipan answered the emergency call in huge mass flight, flying over hundreds of miles of enemy territory, and landing with the much-needed cargo. The unscheduled flight into the Palaus is only one of countless examples of TAG's extraordinary accomplishments performed under aggravating circumstances.

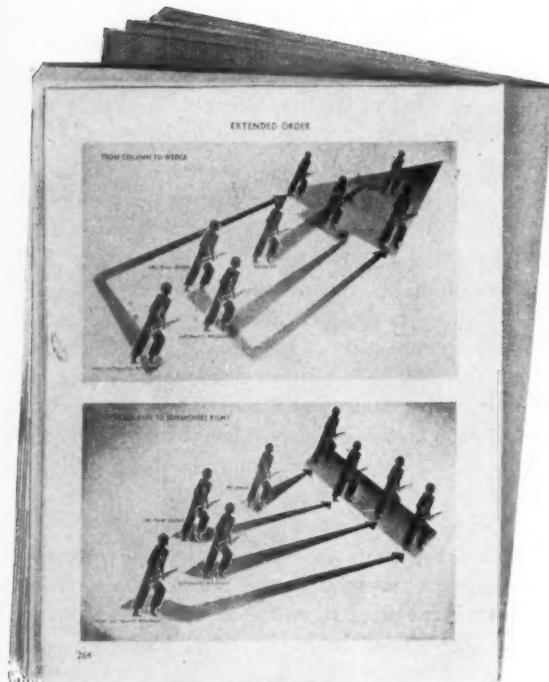
During TAG's tenure of duty, all kinds of items were carried, from bulky aircraft engines to blood plasma and penicillin. The line's activities also contributed to the morale of weary troops by bringing mail from home.

TAG flew its millions of miles without a fatality or serious accident. On countless occasions, when soupy weather would have grounded commercial aircraft, TAG pilots brushed aside the hazard and concentrated on the safe and quick delivery of their cargo.

While Marine aerial fighter units performed heroic feats in support of Marine infantry on Iwo Jima and Okinawa, TAG again accomplished an admirable job as a combat feeder line.

With the end of hostilities, TAG has completed a herculean task in transporting critical materials and personnel, from the continental United States to Pearl Harbor, from Midway through the Solomons, the Marshalls and Gilberts to the western Carolines, from the Philippines to Okinawa, thence to Japan itself. It has etched for air transport history a series of "firsts" which will live long in the annals of Marine aviation.

END



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Ceremony at Peiping

When Chiang Kai-Shek returned to the Chinese capital, one of his first acts was to decorate Gen Keller Rockey of the 3rd Amphibious Corps with the Order of the Cloud and the Banner.